Pay as you go Early adopters reaping benefits of utility computing services, but security and privacy issues loom. **PAGE 10.**

Quick recovery Storage conference highlights move to disk-based data-recovery systems. **PAGE 12.**

NetworkWorld

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April 12, 2004 ■ Volume 21, Number 15

3Com turns 25

3Com was once a heavyweight in the network industry. But missed opportunities, unsuccessful acquisitions and strategic zigzags set the company on its heels. Today, 3Com is fighting its way back to profitability with a new strategy based on enterprise switching, VoIP, wireless and security. Page 42.

Q&A with 3Com CEO Bruce Claflin. Page 46.

IETF to lead anti-spam crusade

■ BY CAROLYN DUFFY MARSAN

The Internet's premier standards-setting body is making its first attempt to develop messaging technology aimed at reducing the amount of spam flooding corporate e-mail servers.

Having researched spam for more than a year, the IETF this month formed a working group that will develop a standard mechanism to eliminate spam that uses a spoofed sender address.

"Identifying the sender of e-mail won't eliminate 100% of the spam problem, but [it] may get 50% to 80%," says Paul Mockapetris, a former IETF chair and the inventor of the Internet's DNS.

"Sometimes spam is sent from a machine where someone has installed a worm. Then the spam is coming from a trusted source so authentication doesn't help," Mockapetris says. "However, if I have a reasonable identification

See Anti-spam, page 14

Linux pressures Windows but experts disagree on cost benefits

■ BY JOHN FONTANA

The cost of deploying and running Linux vs. Windows has been a hot topic lately, fueled by a number of high-profile Linux adoptions and evaluations by government entities in Europe, Asia and the U.S., and Microsoft's own licensing woes.

Microsoft has further fanned the fires by sponsoring a number of total-cost-of-ownership surveys that gave favorable marks to Windows.

In addition to the cost issues, the 2.6.5 Linux kernel, released a few weeks ago, features improved performance and processor support that boosts Linux's standing among network executives.

Beyond the hype, network executives must assess the costs and impact of any Linux deployment just like with any addition of new software.

That fact will make it a tough fight to replace entrenched middleware and operating systems from Microsoft. The software company is working on integrating its enterprise server lineup and desktop operating system while developing a holistic management platform to hold it all together.

The next stage in the evolution of Linux is more enterprise

See Linux, page 60

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A Wider Net

Foundry switches helped link-up "flashmob" supercomputer.

The makings of a do-it-yourself supercomputer

Trying to build one very fast megabox — in a single day.

■ BY LINDA LEUNG

Making a supercomputer these days is a lot easier than you might think. I even helped build one myself in just one day earlier this month.

The call to create the processing beast came from a group of University of San Francisco graduate students whose goal was to entice hundreds of computer enthusiasts like myself to unite their laptop and desktop systems into a megacomputer powerful enough to crack the list of the Top 500 fastest supercomputers on Earth. Topping that list is Japan's 40-teraflop Earth Simulator.

See Supercomputer, page 16

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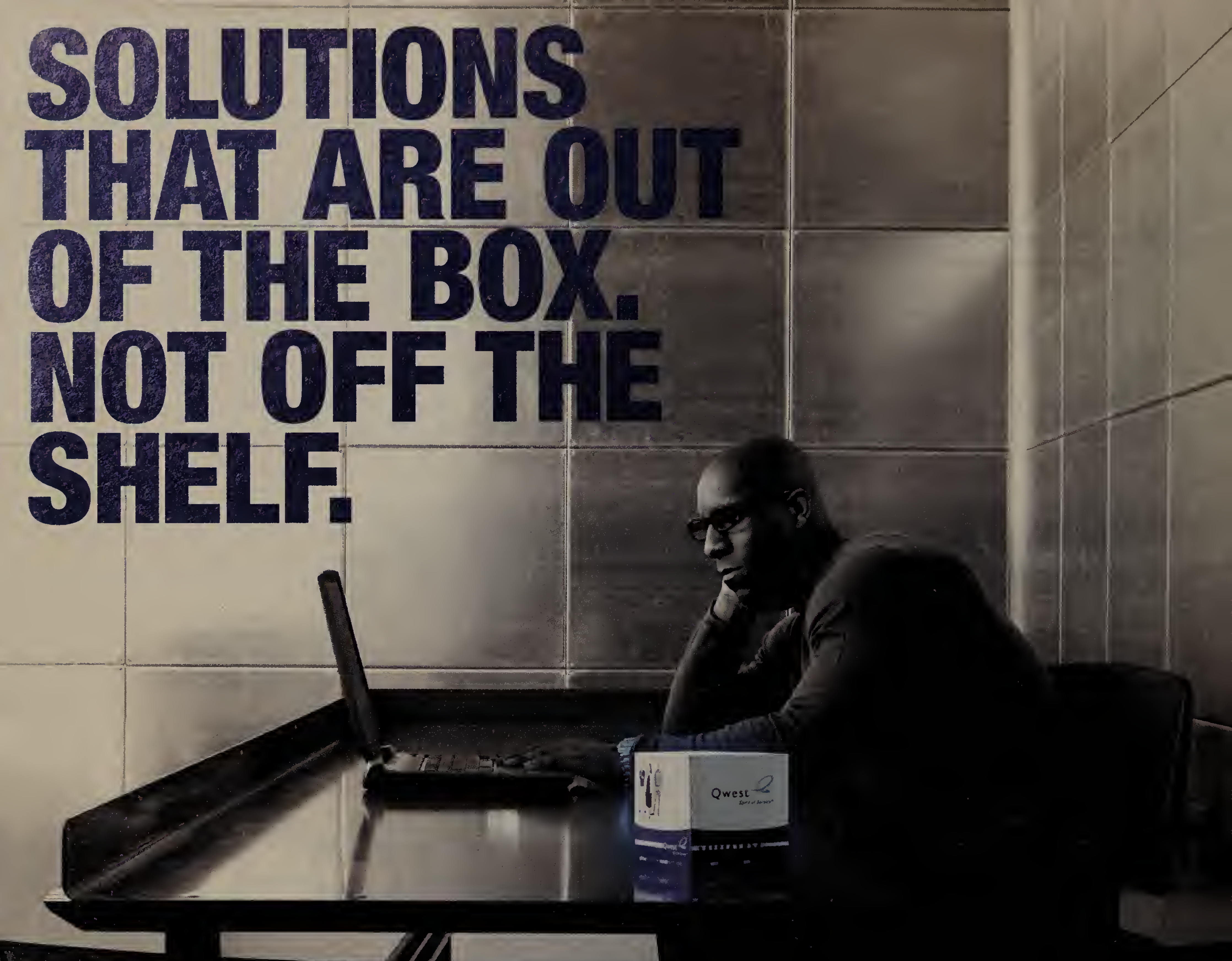
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3Com CEO Bruce Claflin is focused on revenue growth.

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DocFinder: 7442

New standards page

The nice thing about standards is how many of them there are, right? Keep up with all the standards work out there with our new standards page. **DocFinder: 7628**

Wireless LAN Buyer's Guide

We've compiled the largest buyer's guide ever on wireless LAN equipment. Whether you're looking for an access point, PC Card or trying to decide between 802.11a, b or g, take a look at the vendor-provided information on more than 200 products.
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Columnists

Wireless Wizards

Will Microsoft take the LEAP?
The Wizards help a reader who's starting to implement a wireless policy and wants to know where LEAP and PEAP are going in the wireless world. **DocFinder: 1562**

Telework Beat

When you can't work from home, Part Four
Net.Worker Managing Editor Toni Kistner says The Intelligent Office offers a fresh take on a stale model.
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Small Business Tech

Tips for choosing a Web site host
Some from the owners of Edge•Modern, some from Columnist James Gaskin.
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Digital Domicile

Network storage, cheap and fast
Columnist Mike Wolf says Ximeta has the right idea with the $100 NetDisk.
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News Bits

Sun gives Microsoft lay-away plan option

■ As part of their landmark agreement reached this month, Microsoft has the option to pay Sun millions of dollars each year to shield itself from patent infringement lawsuits, Lee Patch, Sun's vice president for legal affairs, said last week. Microsoft will make the payments if it decides to extend a part of the agreement known as the "Covenant Not to Sue for Damages," under which the companies agreed not to sue each other for past infringements. The agreement gives Microsoft the option to extend the covenant for up to 10 more years by making annual payments to Sun. The payments could total up to $450 million by 2014, Patch said. Furthermore, if Microsoft makes the payments each year and does not take Sun to court over patent issues, in 2014 the companies will enter a broad cross-licensing agreement covering all their patents and patent applications filed up to that date. The covenant not to sue is part of the settlement and 10-year collaboration pact Microsoft and Sun struck last week. As part of the deal, Microsoft has agreed to pay Sun $900 million to resolve patent disputes, $700 million to settle Sun's anti-trust case against it, and $350 million in royalties to license Sun technology. Microsoft did not comment on this story.

Google steps into the bulls-eye

■ The gigabyte storage capacity and long memory of Google's planned Web-based e-mail service are making it a target for privacy campaigners — and the name, Gmail, soon could be the subject of a trademark dispute, too. A coalition of 28 privacy and civil liberties groups wrote to Google founders Sergey Brin and Larry Page last week urging them to reconsider the service, which the coalition said sets potentially dangerous precedents for the automated scanning of private communications. When Google announced the Gmail service, the company said it would scan the text of all incoming e-mail to place appropriate advertisements. The service may conflict with European privacy laws and should be suspended until privacy issues are addressed, the coalition wrote. The letter's signatories include the World Privacy Forum and the Consumer Federation of America. Meanwhile, following Google's use of the name Gmail in a press release, financial service provider The Market Age registered its interest in the name with the U.S. Patent and Trademark Office. The Market Age launched a Web-based e-mail service called Gmail in mid-2002.

COMPENDIUM

Catching a scammer red-handed

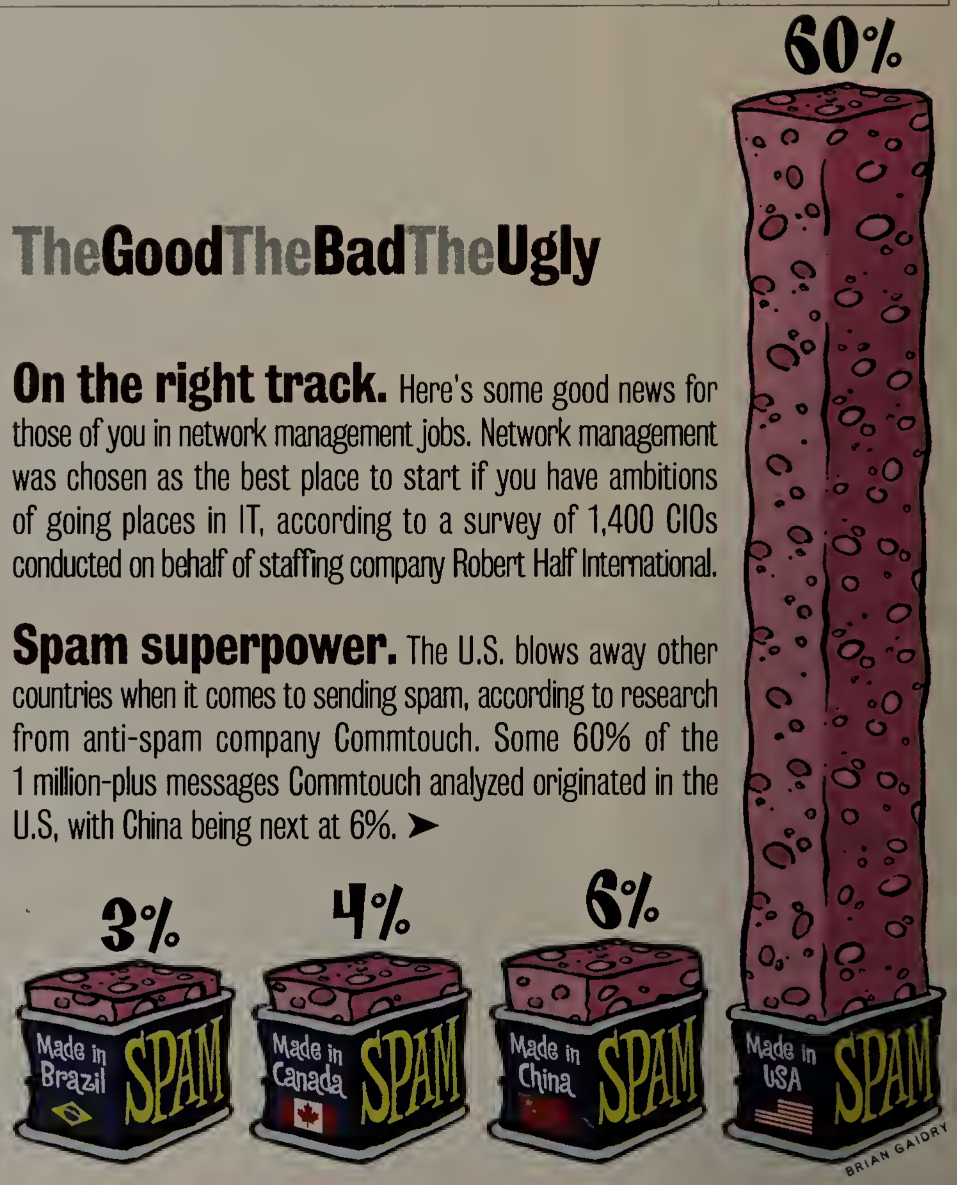
Steffen Higel, who runs an Internet cafe in Dublin, describes how he helped the police catch one of those Nigerian scammers using his network: "He says his wallet and ID are in the booth, so he walks in, rips a USB memory stick from the side of his laptop, tries to swallow it and makes a run for it . . ."

You'll get plenty of stuff you have to see every day, even Monday, in Compendium. www.nwfusion.com, DocFinder: 1556.

■ TheGoodTheBadTheUgly

On the right track. Here's some good news for those of you in network management jobs. Network management was chosen as the best place to start if you have ambitions of going places in IT, according to a survey of 1,400 CIOs conducted on behalf of staffing company Robert Half International.

Spam superpower. The U.S. blows away other countries when it comes to sending spam, according to research from anti-spam company Commtouch. Some 60% of the 1 million-plus messages Commtouch analyzed originated in the U.S, with China being next at 6%. ➤



How rude. Cingular is reviving its "inconsiderate cell phone man" in ads at movie theaters. The promos, featuring a loudmouth with a penchant for using his wireless phone at the wrong place and time, aim to shame patrons into behaving more politely. Of course, the only thing nearly as obnoxious as someone using a cell phone in a movie theater is having to sit through commercials before a film.

Infosys looks to create U.S. jobs

■ Talk about a twist. India software giant Infosys Technologies said last week it would invest $20 million into a business consulting subsidiary in the U.S. that will be managed by four former senior executives of global consulting firms. Infosys Consulting is being led by CEO Stephen Pratt, who until recently was the global leader of the CRM practice at Deloitte Consulting, the business and IT consulting division of accounting giant Deloitte Touche Tohmatsu. The new company plans to hire 75 consultants in the U.S. in the first year, Pratt says. Infosys Consulting has as its managing directors: Romil Bahl, formerly vice president of consulting services at Electronic Data Systems; Raj Joshi, former CEO of Deloitte Consulting Offshore Technology Group; and Paul Cole, former head of the global operations of Cap Gemini Ernst & Young's CRM practice.

It takes a secure village

■ Everyone, from computer users to software vendors to government agencies, is responsible for cybersecurity, Microsoft CEO Steve Ballmer said last week in a speech at the Center for Strategic and International Studies in Washington, D.C. Ballmer said that among the future steps Microsoft will take on security is a service pack for Windows XP, due out in a few months, that will have a firewall turned on by default. A similar update to Microsoft's server operating system will come later. The company also is working on ways to block viruses and worms before computers execute their code, he added. Ballmer called on government agencies to work with vendors on security research, to pass laws that target cybercriminals. He also talked to Tom Ridge, secretary of the U.S. Department of Homeland Security, about ways to better anticipate cyberattacks.

Getting the lead out

■ Facing growing pressure to reduce health risks, Intel and National Semiconductor will start taking lead out of their chip-making process, according to a report in the *San Jose Mercury News*. Lead, the chief component of chip-making, can seep out of discarded computers into ground water, can cause a host of problems, including learning disabilities in children and neurological and reproductive disorders. Beginning this year, Intel will eliminate 95% of the lead used in its microprocessors and chipsets. National Semiconductor will offer lead-free packages for its complete line of chips.

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WLAN vendors take stand in Virtual Showdown

■ BY JOHN COX

The *Network World* Virtual Showdown on WLAN switches that brought six vendors together in a weeklong debate resulted in a flood of information, which highlights product differences in key areas such as security, network management, architectures and pricing.

"There's a lot of material to work through, but it's valuable for showing readers what those differences are," says Craig Mathias, principal at Farpoint Group, a wireless consulting firm that teamed with *Network World* on the showdown. It featured Airespace, Aruba Wireless Networks, Chantry Networks, Extreme Networks, Symbol Technologies and Trapeze Networks (visit the showdown at www.nwfusion.com, DocFinder: 1555).

Some of the most extensive posting was over the benefits/drawbacks of Layer 3 vs. Layer 2 functionality. Vendors like Chantry, which touts its product as a "wireless router," said Layer 3 can accommodate any type of existing network topology, run over any kind of local or long-distance connection and provide the kind of subnet mobility that WLAN VoIP will demand.

"A Layer 3 solution does not require any intrusive network configuration to the existing wired network or complex network design to enable features such as multi-subnet roaming," Chantry wrote.

Extreme, among others, countered that demand for Layer 3 functions among enterprise users is minimal, at least for now, in part because customers are unwilling to deploy proprietary Layer 3 roaming and tunneling features. Instead, customers are more interested in isolating WLAN traffic from wireline traffic via easy-to-configure virtual LANs.

"It's not practical for customers to mix and match wired and wireless users on the same subnet until a complete security framework is well understood and deployed," Extreme wrote. "Standards need to be put in place for seamless security and mobility [at Layer 3] before customers should jump on Layer 3 mobility."

Aruba described one of the more-elaborate roaming schemes: It created extensions to the RFS-2002 Mobile IP standard, typically used for mobility by cellular carriers. Aruba also created what it calls a "Proxy Mobile IP [stack] with Layer 2 extensions," which is loaded on the Aruba switch and "mimics the function of a mobile station, eliminating the need for code on the WLAN clients." A Proxy Dynamic Host Configuration Protocol feature, also on the switch, ensures the client maintains its address across subnets.

> **"It's a not practical for customers to mix and match wired and wireless users on the same subnet until a security framework is well understood and deployed."**
>
> **Extreme**

VoIP over WLAN

Vendors insisted that running IP voice traffic over WLANs is the next big thing. Mathias wanted more specifics: "What facilities do you have in your products to support voice while simultaneously providing acceptable data throughput?" he asked.

Aruba's reply began with voice security, saying VoIP phones "can't be effectively authenticated on wireless networks because there is no way to pass credentials into the infrastructure." Aruba's solution is to create what it calls "stateful voice flow classification technology," which identifies voice traffic and enforces security restrictions on these devices and the traffic they create.

Aruba said one result of this capability is the network then can give priority to voice traffic by applying quality-of-service (QoS) policies, as long as the underlying IP network supports this.

Airespace addressed the voice question by citing its QoS model, which is designed to support the requirements of the emerging IEEE 802.11e QoS standard. The company encrypts voice traffic at both access point and switch, so that packet inspection takes place at the network edge, a feature required for 802.11e support, according to Airespace. Voice users can roam on an Airespace network without using Mobile IP, which eliminates the need to support the protocol at the client or routed infrastructure level.

Trapeze said it divides the QoS responsibilities: Traffic classification takes place in the switch, while the access points maintain traffic queues per user. "Voice traffic is always served by the expedited traffic queue," Trapeze wrote. "All traffic in the expedited queue is handled fairly amongst voice users, and it's always ahead of data [traffic]."

Pricing

The Virtual Showdown also revealed some dramatic pricing differences among the participants (see graphic). Mathias cautioned, however, that prices are always negotiable and the numbers cited are best seen as a basic starting point because there are so many variables.

List prices for the high-end switches range from $7,500 for Symbol to $22,000 for Trapeze. There was wide variation in the number of companion access points each box supported, either by tunneling or by direct attachment.

Two-radio access points, which have a 2.4-GHz 802.11b/g and a 5-GHz 802.11a radio, range in price from $390 for Symbol to $795 for Extreme.

Some vendors include network management software and radio frequency planning and management software; others charge separately for these applications. ■

WLAN switch pricing

Vendors in the *Network World* Virtual Showdown on WLAN switches spelled out pricing schemes. Check out the showdown at www.nwfusion.com, DocFinder: 1555.

Vendor*	High-end switch	Two-radio access point	Other
Airespace	4102: $13,125	$550	Net management: $1,000
Aruba	5000: $20,000	$500	IDS software: $8,000
Symbol	WS 5000: $7,500	$390	Net management: $5,000
Trapeze	MX-400: $22,000	$550	RF management: $2,000
Extreme	WLAN blade: $3,000	$800	Alpine switch: $7,000

*Chantry provided some pricing guidelines but did not give the list price for its high-end switch or software applications. The two-radio access point is $395.

Access points are connected to switches directly via ports or indirectly via tunnels. The number of supported access points varies widely. Some applications are included; others are priced separately.

Solaris ready for Sun's Opteron

■ BY JENNIFER MEARS

Sun last week rolled out the sixth update to Solaris 9, which includes support for new platforms, including the Opteron-based Sun Fire V20z. The updated operating system also now supports Sun Blade 1500 and 2500 workstations and the new Sun Fire E25K, which runs up to 72 processors.

Sun also made available for testing features planned for upcoming Solaris 10, including N1 grid containers, which will let users divide single servers into multiple software partitions, all running under one operating system.

The latest release of Solaris 9 also includes a number of performance enhancements, including support for throughput computing using the chip multithreading capabilities in the new UltraSparc IV processors.

The Solaris 9 updates come as Sun prepares to roll out the next generation of the operating system. Solaris 10 is expected to debut in the third quarter. In the meantime, Sun is offering a hands-on sneak preview of the upcoming features in Solaris 10 through its Software Express for Solaris program, which it launched last fall to provide users with monthly access to the newest features that Sun developers are working on.

Last week, Sun made available new Solaris features, including N1 grid containers, which lets users divide a server into more than 8,000 software partitions, which all run under one operating system. Other updates include a self-healing feature that lets hardware and software automatically diagnose, isolate and correct problems.

The latest release of Software Express for Solaris is available at www.nwfusion.com, DocFinder: 1539. The sixth update to Solaris 9 can be downloaded at DocFinder: 1540.

Also last week, Sun announced an agreement with Rackable Systems under which Rackable will certify its Xeon- and Opteron-based systems for Solaris. ■

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Utility computing services catching on

Pay-per-use offerings chosen for cost savings, flexibility.

BY DENISE DUBIE AND ANN BEDNARZ

In some ways, manufacturer Rockwell Collins is an ideal customer for HP's powerful Superdome computers. The maker of avionics and communications systems needs the sort of processing power that the Unix-based machines deliver to handle its engineering, ERP and product development applications, some of which require half-second response times.

The problem, though, is that the Cedar Rapids, Iowa, company needs four of the 128-processor systems, and with starting prices of $300,000 per unit, that's more than Rockwell Collins wants to spend.

The solution? Rockwell Collins has signed on for a pay-as-you-go offering that lets it house four of the machines in its own data center without buying the systems. Rather, HP enters the network through a secure connection once a month to measure average CPU utilization and charges the company accordingly. (Rockwell Collins would not discuss financial details.)

"We wanted the ability to rapidly scale up or down to meet our business demand and to turn a fixed cost into a variable cost," says Jed Young, director of enterprise services of Eastern regions for Rockwell Collins, which has a similar deal with EMC for storage disk space. "Paying HP for that usage eliminates any overhead or unused capacity."

Pay-as-you-go services offer a glimpse into the utility computing world that HP, IBM, Sun and others envision and that they started to promote a few years ago. Utility computing services give companies a way to start exploiting new technologies before all the pieces of an ideal system for automating data centers are deliverable.

Utility computing services apply to software and hardware.

"From a licensing perspective, there has been much pushback from customers over hefty upfront charges or paying maintenance for unimplemented technology," wrote Jason Maynard, a software analyst at Merrill Lynch, in a recent report.

For Steve Evans, vice president of information systems for PGATour.com, in Ponte Vedra Beach, Fla., cost concerns dominated his decision to partner with IBM to host the organization's TourCast application. The program gives Web site visitors play-by-play statistics, weather conditions and other up-to-the-minute golf tournament data.

While the application initially piqued his bosses' interest, Evans didn't have the go-ahead to buy the infrastructure needed to support it. PGATour.com wanted proof that the application would earn at least as much money as it cost to get it off the ground.

Evans started talking to IBM in June 2002 about adopting the company's on-demand model, which he says enabled him to scale up the application in correlation with the number of subscribers on an ongoing basis. TourCast, which costs subscribers $10 per month, rolled out in February 2003. IBM hosts the application at a Boulder, Colo., data center on a mainframe that is partitioned into instances of Linux virtual machines.

The application is updated with data input by collectors at PGA tour events and by PGATour.com staffers in Florida.

"If something doesn't get done on our end in Florida, it will affect the application. We still manage the process; we just don't manage the technology," Evans says.

Although he wouldn't get into dollar figures, Evans says the pay-as-you-go model is 35% more cost effective than a traditional outsourcing setup because PGATour.com is paying only for the resources it needs.

Such utility computing services look like traditional outsourcing and application service provider deals because they provide customers with flexibility and require fewer upfront costs. But there are differences, such as paying for only what you use instead of a flat fee. And services such as the one used by Rockwell Collins, through which the company has HP's systems on site, differs from common outsourcing setups in which the systems are at the service provider.

"We do not believe this change can be viewed simply as a return to time-sharing during the mainframe era or some rehashed dot-com hype story around application service providers," Merrill Lynch's Maynard wrote in his report. "We think the change is more far-reaching and customer adoption is moving at a rapid pace that will catch many vendors, customers and investors by surprise."

However, Rockwell Collins' Young says utility computing isn't a cure-all. He chose not to adopt the model for his Wintel environment, since the capital outlay for Windows running on Intel servers was less than that of getting the same capacity as a service.

"Transactional-based systems lend themselves to pay-for-use," he says. "If you're looking at fixed costs, using a service may not help."

Mike West, a program director at market watcher Saugatuck Technology, says some applications will prove too complex to convert into outsourced pay-as-you-go services.

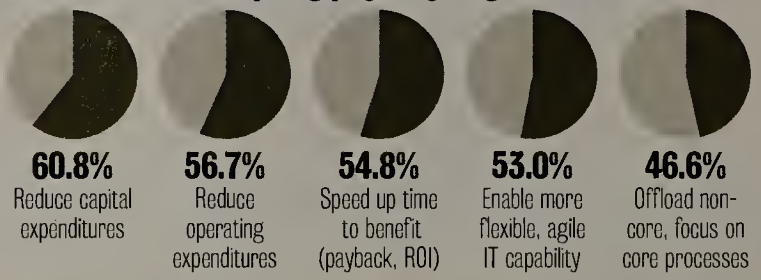
"The last several years of application integration projects, driven by the pressure to link systems together, sometimes has been done in a way that isn't architecturally sound," he says.

Where utility computing services will start to get really interesting, Think Strategies' Jeff Kaplan says, is in situations where early adopters of these services implement their own utility computing infrastructures. "But initially they're putting the onus on vendors such as IBM and HP to build it out for them and manage it for them until it's been fully proven to be successful," he says.■

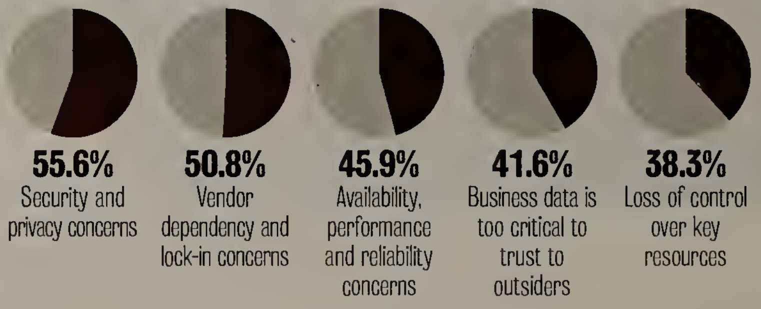
Pros and cons

Users surveyed say they are intrigued by possible cost savings and return on investment from utility computing services, but have security and privacy concerns (multiple responses allowed).

Motivators to adopting pay-as-you-go services



Inhibitors to adopting pay-as-you-go services



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What to ask

IT managers considering utility computing services should ask vendors if their offerings will help:

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- Provide faster technology development and deployment times, and speed rollouts of new IT services.
- Let IT departments move expenses from fixed costs to variable costs and keep the variable costs in line with that of the business.
- Drive ongoing expenses, such as upgrade, maintenance and support costs, out of IT systems.
- Simplify running IT systems in the long term and ease changes as business demands evolve.

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Data recovery rules at storage show

■ **BY DENI CONNOR**

PHOENIX — The problem isn't really about backing up data, it has more to do with recovering it.

That was the word from last week's Storage Networking World conference in Phoenix, which show organizers said 2,500 people attended.

To address the need for faster data recovery, users said they increasingly are shifting from tape to disk. Although disk remains more expensive, the variety of disk-based systems is exploding, and prices are dropping.

Vendors introduced a host of disk-based recovery systems. Announcements included:

- EMC's Clariion Disk Library, which enables disk-based backup and recovery but looks to back-up software as if it were tape-based. A 500G-byte DL300 system starting at $109,000 still costs about 50% more than a comparable tape system — but the company says the product can back up and recover data in a fraction of the time.
- Ciena's CN 2000 Storage Extension Platform, which speeds backup, recovery, mirroring and clustering across distances by enabling multiplexing of applications across separate physical channels within the same SONET/synchronous digital hierarchy or dense wavelength division multiplexing circuit.
- Storactive's LiveServ for Exchange, continuous back-up software that like EMC's Disk Library, backs up data to disk.
- HP's Fiber-Attached Technology Adapted drive technology, which it developed with Seagate Technology and uses disk for data backup and archiving.

According to Enterprise Storage Group (ESG), products such as these are in sync with customer needs. The firm's recent study found that 53% of customers in the near future plan to back up all their data to disk at some point in its life cycle.

"Seventy-five percent of those individuals will still use tape for archival purposes," says Tony Asaro, an analyst at ESG. "They will use disk for their immediate recovery needs and then put everything else to tape.

Aiming to replace tape-based backup systems with faster disk-based devices, EMC's new storage appliances will include the 500G byte Clariion DL300 (left) and 32T byte Clariion DL700 disk libraries.

"Using disk instead of tape will give you performance increases on both backup and recovery," Asaro says. "On the recovery side, you get a lot of performance improvements just from the fact that if you need to recover a single file from a tape library, you need to physically find the tape that contains the file." Other benefits he cites are increased data integrity and the elimination of media management issues.

Lari Sue Taylor, senior vice president and director for enterprise information security and recovery at FleetBoston Financial in Boston, is a convert from tape to disk for backup and recovery. The financial firm uses a disk-based system supported by EMC's Symmetrix Remote Data Facility in adaptive copy mode that boasts recovery of business-critical systems in less than one hour and full recovery of all systems in four to eight hours.

That's a far cry from earlier tape-based systems, including a remote vaulting service. "We found that just recovering tape to disk and moving all the data we had would take a full 24 hours," she says.

JetBlue Airways uses ADIC's Pathlight VX, which includes tape and disk drives in one library, for backing up 3T bytes of data.

"One of the factors in our decision to migrate to disk from tape is real estate — we'll use three times less space than we do with tape," says Oleg Ivanov, IT systems analyst. "The others are that we'll eliminate physical and mechanical failures of the tape infrastructure, and it's absolutely faster to recover data [from disk] than from tape. . . . [We] back up twice as fast and save $1,500 on tapes a week." ■

Foundry makes push for data center switch

New ServerIron Layer 4 to Layer 7 switches, appliances add application awareness, security.

■ **BY PHIL HOCHMUTH**

Foundry Networks this week is expected to make a large data center product push, with upgrades to its core switches and an appliance to help customers protect servers and boost traffic performance.

The ServerIron 450 and 850 modular Layer 4 to Layer 7 switches could help companies improve traffic flows in and out of large server farms or clusters. Foundry also is upgrading ServerIron software to optimize flows of certain application protocols that are emerging e-business standards. Also on tap is the ServerIron GT appliance, which sits inside of a data center and acts as an "internal firewall" for protecting servers.

On the speeds and feeds level, Foundry says the new ServerIron four-slot 450 and eight-slot 850 improve the number of TCP/IP requests and Layer 7 packet inspections per second, compared with the previous ServerIron 400 and 800 (from 28,000 Layer 7 lookups per second to 55,000). New blades for the switches support up to 48 10/100/1000M bit/sec on one slot. Dual-port 10G Ethernet blades are now available for both switches.

The Layer 4 to Layer 7 upgrades mean users can support more clients with less servers, when the boxes are deployed behind ServerIron switches, Foundry says. Improved SYN packet handling will let ServerIron switches absorb and nullify more Web-based server attacks without disrupting applications and access to Web sites.

"The [denial-of-service] protection is key for us," says Greg Conroy, a network engineer at Interland, an Atlanta server hosting firm that soon will deploy the ServerIron 450.

"No firewall is going to stop 5 million [SYN] packets per second," he adds, referring to the new ServerIron's SYN packet-filtering capabilities — up from a previous threshold of 1.5 million.

Conroy adds that ServerIron 450s will be deployed soon at the edge of each of Interland's data centers, along with firewalls, to thwart DoS attacks.

Along with the beefed-up Layer 4 to Layer 7 engine, Foundry added support for accelerating specific types of protocol traffic through the ServerIron boxes. Accelerating Web services traffic could let applications based on .Net and Java frameworks run more smoothly, as flows to and from servers are given priority at the data center's door — the ServerIron switch, Foundry says.

Hooks in the ServerIron operating system now can identify protocols used in Web services applications, such as XML and Simple Object Access Protocol, VoIP applications with Session Initiation Protocol and specific financial industry-focused applications that use the Financial Information Exchange (FIX) protocol.

With its customized support for the FIX protocol, Foundry says its ServerIrons can increase the availability of financial trading and data delivery applications. FIX is a standard for exchanging financial securities in real time. It is used in products from vendors such as Reuters and Aegis Software.

Foundry also is launching its ServerIron GT appliance. The network processor-based box is targeted as an internal firewall for data centers, and supplies DoS protection, Secure Sockets Layer (SSL) acceleration and even spam-filtering capabilities.

With the addition of application-level traffic shaping and security acceleration to the ServerIron line, Foundry is answering market challenges from some start-ups that offer data center gateway products, industry observers say.

These vendors include NetScaler, which uses high-end Intel PC hardware to run Layer 4 to Layer 7 switching, load balancing and traffic management services. Redline Networks is another emerging competitor, with hardware that performs traditional load balancing, and traffic compression, encryption acceleration and security features for data centers. The ServerIron products also compete with gear from traditional Layer 4 to Layer 7 vendors such as Cisco, F5 Networks, Nortel and Radware.

The ServerIron 450 and 850 start at $35,000 and $39,000, respectively, for a chassis and management module. The ServerIron GT costs $15,000 for a 4G-port version, and $22,000 for additional SSL support. A 12G-port version with SSL is also available for $28,000. ■

THIS WEEK'S QUESTION:

How many low-earth orbiting satellites make up the Boeing-operated Iridium Satellite System, which launched commercial service in March 2001?

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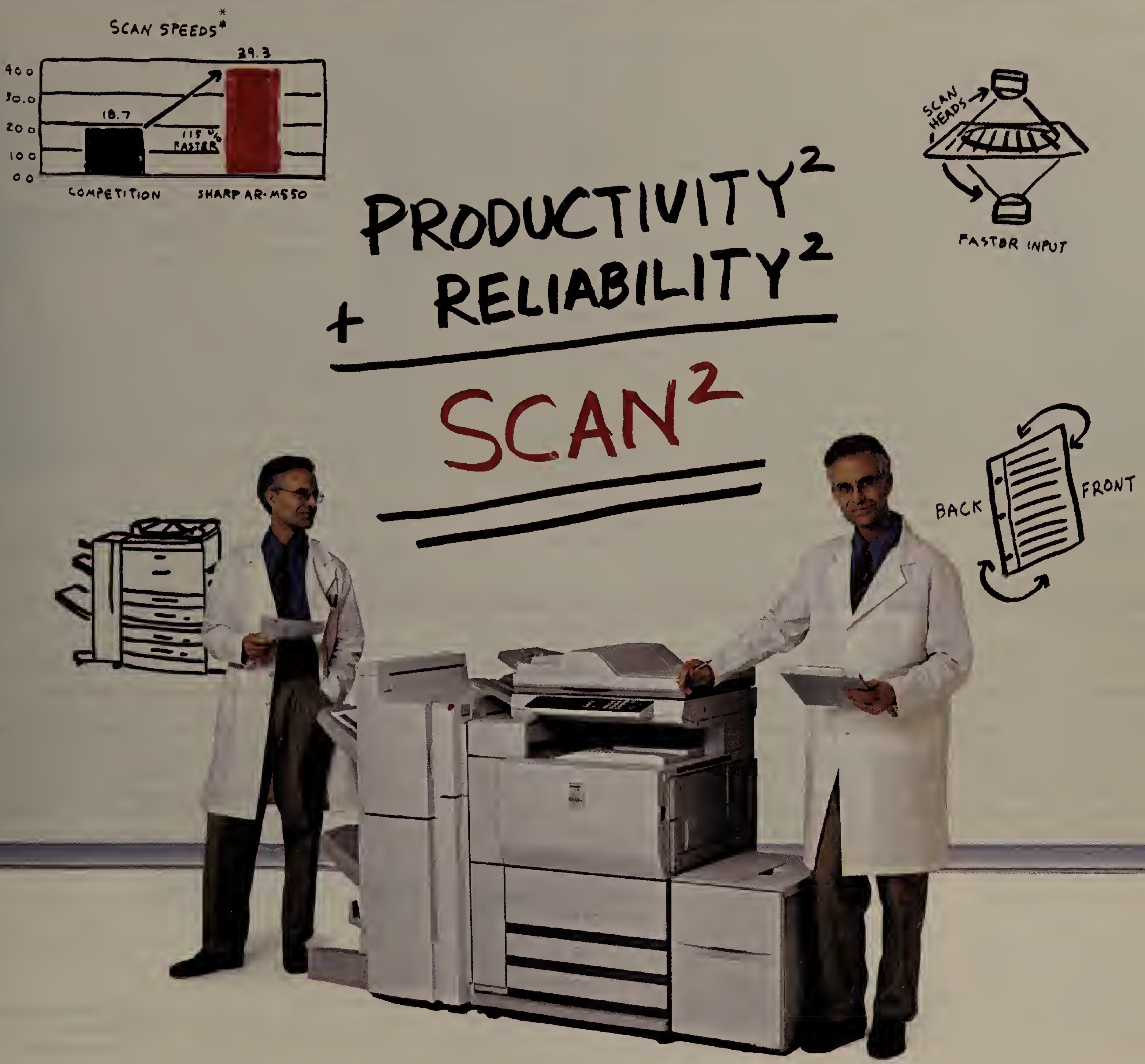

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Sonic upgrades software to speed failovers

BY JOHN FONTANA

Sonic Software this week will add unique replication technology to its message-oriented middleware designed to dramatically reduce the time it takes for a failed system to recover.

The replication technology in Sonic 6.0 and its Continuous Availability Architecture ensures that a cluster of message brokers know what each other are doing and can take over a workload within seconds if one fails.

"We can now say that no single part of our infrastructure or software failing will prevent a customer from knowing what's happened to their transaction," says John Brann, chief architect for FXall, a financial exchange trading portal that uses Sonic software. "The Sonic brokers reliably fail over, and the transaction is going again within 10 seconds."

Brann says that kind of continuity is key for keeping happy customers, who average $2 million per transaction. FXall is replacing a Veritas Software clustering system it says takes minutes to complete failovers.

Sonic's fault tolerance works by mirroring onto a back-up broker the transaction running on the main broker. However, the backup broker is not in a passive mode; it runs its own transactions using only a percentage of the available CPU cycles so it can accommodate a failover.

"The redundancy is all done in Sonic software; there is no reliance on high-availability hardware or software," says Gordon Van Huizen, Sonic's CTO.

Sonic 6.0 costs $15,000 per fault tolerant server pair and runs on Windows 2000 and NT, HP-UX, IBM AIX, Red Hat Linux and Sun Solaris. ■

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Anti-spam

continued from page 1

of the sender, I can at least be sure that I do get legitimate e-mail from repeat correspondents."

The IETF's new working group plans to develop a DNS-based mechanism for storing and distributing information that authorizes an e-mail server to send messages from a particular domain or network. The group is dubbed MARID because it will create message transfer agent (MTA) authorization records in DNS.

By targeting spam, MARID has set its sights on one of the biggest headaches facing corporate network managers. In March, 68% of all Internet e-mail was spam, according to anti-spam vendor Brightmail. Brightmail says it filtered 2.93 billion fraudulent e-mails in March, up 25% from the previous month.

"Everyone realizes this is a really big problem," says Andy Newton, co-chair of the MARID working group and a network engineer with VeriSign. IETF participants don't "want to spend a lot of time on infighting and political bantering. They're just focused on fixing the problem," he says.

The MARID technique will be most successful at eliminating spam when it is widely deployed across the Internet's e-mail servers, experts agree. However, corporations might choose to be early adopters of this technology to prevent spammers from spoofing their domains and eliminate outbound spam.

"A company like Citibank would probably like to make sure every bit of e-mail that comes from their domain is their e-mail," says John Levine, co-chair of the Anti-Spam Research Group run by the IETF's sister organization, the Internet Research Task Force (IRTF). "Companies can set policies that say if e-mail has this characteristic, it's really from us. If it doesn't, don't accept it. In some ways, MARID may help corporate networks more than it will help consumer ISPs because they have more control over their users."

MARID could be controversial, as it is expected to choose between authentication schemes backed by e-mail giants Microsoft, Yahoo and others.

The IETF already has received several proposals outlining ways to reduce spam by authenticating e-mail servers. Microsoft says it will submit to the IETF its Caller ID for E-mail Specification, which outlines a scheme for thwarting e-mail address spoofing. Yahoo is expected to submit an alternative proposal called DomainKeys, which use digital signatures to authenticate e-mail servers.

Despite market pressure, IETF officials say they are unlikely to adopt a proposal from Microsoft or Yahoo without making significant changes to it.

"The MARID work must take a step back and agree on what the problem is to be solved," says Patrick Faltstrom, a member of the IETF who directed the group's discussion in March on whether to establish a working group in this area. "After this has happened, [the group] can measure the proposals against the goal."

MARID plans to select a proposal by June and finish its specification by August.

Challenges galore

This will be a tough schedule to meet given that MARID faces more challenges than navigating the politics between Microsoft and Yahoo.

"Things are moving ahead, but we still have to resolve some fairly deep issues," says Levine, who is best known for writing the book *Internet for Dummies* and, more recently, *Fighting Spam for Dummies*. "What is the problem we are trying to resolve? Is it spoofing? Is it authentication? Is it forged spam? Are we attempting to make all e-mail more accountable?"

Levine says one challenge for MARID is defining legitimate and illegitimate senders of e-mail. As an example, Levine mentions popular Internet services such as greeting card and newspaper Web sites that let users send e-mail to someone else using personal e-mail addresses. This e-mail could be classified as coming from a spoofed address.

Whatever proposal selected, the working group has vowed not to make significant changes to either the DNS or the Simple Mail Transfer Protocol.

Newton says companies that want to improve their spam filtering to reject unauthorized e-mail coming into their organizations likely will need to upgrade their e-mail server software to support MARID. "The general feeling of the working group is to make this [an upgrade] to the mail server, not the client," he says.

MARID promises to be a high-profile effort within the IETF community.

The IETF held a preliminary meeting in early March in Korea to see if there was enough interest to form a working group to develop MTA authentication records. More than 100 network engineers attended the meeting. After the meeting, advocates of MARID set up a mailing list, and hundreds of comments about the MARID proposals have been posted in the last three weeks.

Even MARID supporters say this approach is not likely to be the ultimate solution for spam. MARID only addresses spam that comes from a spoofed e-mail address. And it will only work when e-mail servers activate new features that would let them determine the source of e-mail that contains spam.

That's why the IRTF's Anti-Spam Research Group is exploring other ways to eliminate spam, including real-time exchange of spam filters and e-mail abuse reporting standards and publishing best practices for network managers. ■

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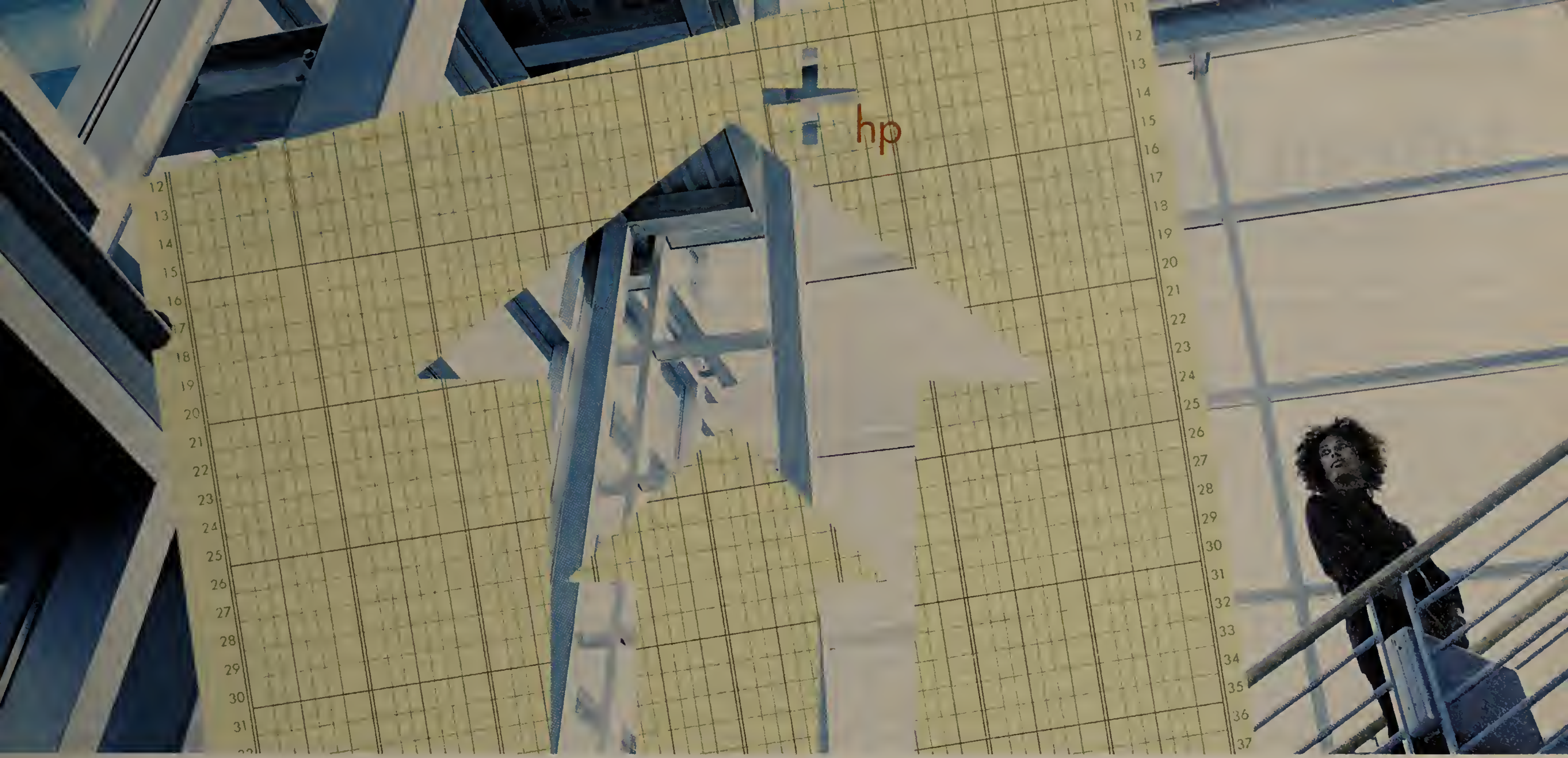
Plenty to choose from

The IETF's new MARID working group is considering several proposals for e-mail server authentication:

Proposal	Sender Policy Framework	Marking Mail Transfer Agents in Reverse DNS	Designated Relays Inquiry Protocol	Flexible Sender Validation	*Caller ID for E-Mail Specification	*DomainKeys
Company	Pobox.com	SpaceNet AG	N/A	Taughannock Networks	Microsoft	Yahoo
Description	A domain owner asserts that legitimate messages from that domain must meet a certain description, which is published in the DNS. Messages that do not meet that description are not legitimate.	Lets a network administrator mark IP addresses in the DNS with labels that identify whether a host is authorized to send messages across the Internet.	Domain name owners specify the IP addresses that are authorized to relay mail as a domain name in the SMTP HELO and EHLO commands.	A lightweight validation scheme that publishes information in the DNS about IP addresses authorized to send mail for a domain. FSV uses redundant copies of IP data.	Companies register the IP addresses of their outgoing e-mail servers in DNS. The recipient's e-mail system would verify through DNS that the server's domain corresponds with an authorized server.	Uses digital signatures to authenticate e-mail servers. The outgoing message is digitally signed with a private key, and the recipient e-mail server uses a public key to validate the signature.

NOTE: * Expected proposals.



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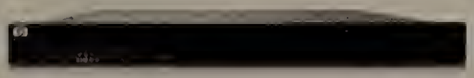

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Adtran keeps trying to undercut Cisco

■ BY TIM GREENE

Adtran is expanding its assault on low-end network gear for businesses, joining 3Com, Enterasys Networks and others hoping to relieve Cisco of some of its cost-conscious small- and midsize business customers.

The introduction of Adtran's four NetVanta 1224 products is marking the company's first foray into LAN switching, broadening its small-business portfolio beyond routers, firewalls and VPN gear. These devices could be attractive to customers willing to trade off buying from a vendor with a full suite of network gear for one that charges less for a smaller family of products.

The 1224 family includes a unique box, the NetVanta 1224STR, that consists of a 24-port Ethernet switch, a router with firewall and VPN support, and a T-1 DSU/CSU all housed in one appliance. By integrating these three devices in one product for $1,600, Adtran says companies can save $1,900, compared with buying separate Cisco switches and routers for $3,500. Such savings can be persuasive.

NetVanta 1224STR is Adtran's new LAN switch with built-in WAN router and CSU/DSU.

Price is a key factor for the Huntsville, Ala., public schools, says Ron Potee, interim director of IT for the district. He has three Adtran combination router/switches and plans to buy one for each of the district's 50 sites to replace aging Adtran DSU/CSUs, Cisco routers and Foundry Networks' switches. A tight budget is forcing him away from a three-box configuration.

"We paid a pretty penny for the Foundry switches. And Cisco is good, but it's expensive," he says. A 24-port Foundry switch that is upgradeable to full routing can cost $3,000, whereas a NetVanta 1224 could be as low as $795.

In looking at continuing support costs, he says it is less expensive to buy spare Adtran 1224STRs that can be swapped in within a half hour if one fails — which happens often in lightning-prone Huntsville — than to buy a service contract. "We're not big on recurring costs," Potee says.

The key to savings is whether these lower-cost devices can be managed effectively from remote locations, says Michael Kennedy, principal and co-founder of Network Strategy Partners. "Management time is a big cost, and if I can manage a device from a [network operations center] I don't have to send somebody out," he says.

To aid in its plan to undercut Cisco, Adtran has designed a command-line interface for its management platform that is similar to Cisco's, making it easier to learn for network IT workers who have been trained on Cisco gear. Adtran also is introducing a management graphical interface for those more comfortable with that format. (Customers can test-drive it at www.nwfusion.com, DocFinder: 1561.)

While Adtran stresses its products' lower costs, the company also is a cut above low-end vendors such as Allied Telesyn and Netgear, in that Adtran offers management and more-comprehensive customer support, says

See Adtran, page 60

Supercomputer

continued from page 1

Armed with my 2.4-GHz Pentium 4 Compaq notebook, I joined roughly 300 people at the USF gym where we were put to work building the so-called Flashmob1 supercomputer.

Overnight, staff and students had transformed the gym into a massive data center. Neat bundles of Ethernet cables lined the edges of the rows of tables that filled the gym. The cables trailed from four Foundry Networks switches that were positioned around the room. An imposing platform stood in the middle of the gym where lecturers and a few students would sit and monitor Flashmob1's beating heart.

After checking our computers with the security monitors at the gym's entrance, each volunteer was given directions to the table that would house their particular speed of machine. "A Pentium 4?" asked my security monitor with a nod of approval. "Go to the back of the room."

There, a hub captain, who was dressed in the staff uniform of a black T-shirt with the Flashmob1 logo, helped me set up my machine. I told him I'd brought my power pack. "Good, you'll need it," he said. "If your laptop ran on battery, it'll last just 10 minutes calculating this benchmark."

He booted up a CD that contained all the software that my machine would run that day. "A supercomputer on a disk" was how it was described by Pat Miller, a computer scientist at the Lawrence Livermore National Laboratory in Livermore, Calif., and a USF lecturer.

Miller seemed relaxed considering he was expecting 1,400 machines to turn up. A system with that many nodes would boast 600 gigaflops of processing power — enough to crunch the benchmark that all Top 500 hopefuls need to run in less than four hours, and put our Flashmob1 supercomputer at the bottom of the next Top 500 list that's published in June.

It was Miller's do-it-yourself supercomputing class that sparked the idea of Flashmob Computing. Inspired by "flashmobs," a recent craze of organizing a group of strangers to turn up at a given place to do something off-the-wall, like singing a song, and then disperse once the deed is done, the students wanted to invite volunteers to donate their machines for the day.

The task was enormous. "The limiting factor is memory size [of the nodes]," Miller said. I thought about my laptop's 512M-byte memory capacity. "We're taking in a lot of boxes, and some could randomly break … there could be bad network cables. We're beating on the memory very fast, and the processor would be working all the time." If one of the computers failed during the benchmark, then Flashmob1 would collapse.

By 11 a.m., everyone except hub captains had to clear the gym; a test of the system was about to take place. Experts at HP had advised the organizers to test the benchmark on small groups of computers at a time to weed out the weaklings. For a typical 1,000-node supercomputer, HP says it takes about a month and a half to test the nodes and another three months to do acceptance testing. The Flashmob team had two hours before its self-imposed deadline of 1 p.m. to begin the first of two benchmarks. The supercomputer would be dismantled at 6 p.m., and the best result would be submitted to the Top 500.

In USF's gym, rows of PCs and laptops were linked together in an effort to create a world-class megacomputer.

Foundry engineers had spent the previous evening setting up and testing the backbone network. The company provided a 10G Ethernet network based on four FastIron 1500 Layer 2/3 modular network switches. Each came loaded with a two-port 10G Ethernet module and six 48-port 10/100 modules, which supported the clients.

Volunteers could watch the Flashmob team at work from several windows. We saw a few people at the platform glued to their monitors, but the other hub captains sat talking and guzzling Red Bull energy drinks.

At 4 p.m., after attending some head-spinning talks about supercomputers, I returned to the gym. The news wasn't good. Bad network interface cards in some machines were causing huge problems.

"Although [the computers' network connections] are meant to be rated 100 Base-T, maybe some of them weren't so high," Miller said. The supercomputer also hit problems when the Flashmob software tried to use the wireless LAN card inside some of the computers.

The final number of systems brought in by volunteers was 700. In the end, after much testing and trying to pinpoint the network problem, the Flashmob team began a benchmark test at 4:15 p.m., with 256 computers. After 70 minutes, the supercomputer had completed 75% of the calculation before a bad node made it collapse. That test yielded a performance rating of 180 gigaflops. That's not nearly the 600 gigaflops hoped for, but it is quite a system in itself — a supercomputer with that performance could be used to do plasma modeling, said Greg Benson, assistant professor of computer science at USF.

Despite the technical problems, organizers were excited they had achieved one of their goals: to prove that supercomputers can be built using ordinary computers. They envison a time when communities could build mini-Flashmob computers to help solve ad hoc queries. Flashmob computers could help high school students study the ozone hole, or help a group of neighbors predict the outcome of gas leaks.

Both Miller and Benson said they will be involved in other Flashmob efforts with the scientific community, and that many universities across the world had contacted USF with an interest in setting up Flashmob2.

The university had built the Flashmob software to let them pinpoint memory and CPU problems, but in the end, they were hammered by network issues at the client that they hadn't anticipated. ■

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Infrastructure

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■ VOIP ■ WIRELESS NETWORKS

Short Takes

■ **HP** said last week it will begin offering **low-cost Fibre Channel disks** in July that will cost about one-half the price of current Fibre Channel storage. The new drives will be manufactured by **Seagate Technology** and sold as an option for HP's StorageWorks Enterprise Virtual Array family of storage arrays. They will use many of the same components as inexpensive Advanced Technology Attachment drives, but also will include firmware and components that let them support the Fibre Channel interface. HP did not have pricing information on the new drives, but said they would be provided as an option for its StorageWorks Enterprise Virtual Array 3000 and Enterprise Virtual Array 5000 devices. Customers will be able to mix the new Fibre Channel drives with HP's existing Fibre Channel disks, HP said. HP also said it would begin selling a new 128-port StorageWorks B-series SAN director switch, manufactured by Brocade. HP also announced an update to its IP Storage Router 2122. Called the 2122-2, it supports the iSCSI and Fibre Channel Internet Protocol protocols. The 2122-2 costs $12,000. Pricing for the SAN director switch was not available.

■ **Dell** last week said it will sell **Oracle's Standard Edition One database software** pre-installed on two-processor PowerEdge servers. Dell will sell PowerEdge 2650 and PowerEdge 2600 servers that have been pre-tested and configured to support the Oracle software. Dell will act as the single point of contact for support for both the hardware and software installation. The combined hardware and software platforms are available for order now with Red Hat Enterprise Linux starting at about $4,000. Dell also will factory install Oracle Standard Edition One with Red Hat Linux and Windows on the PowerEdge 2600 and 2650 servers, Dell says. The announcement comes a year after the companies partnered to push clusters of low-cost systems running Oracle software.

Emergency service challenges VoIP

■ **BY PHIL HOCHMUTH**

While support is improving for Enhanced 911 emergency services on corporate VoIP systems, IT professionals and analysts say the technology is not yet standardized across platforms and can be tricky to use in mixed-vendor environments.

E911 is the FCC's advanced version of the well-known 911 emergency-calling system that provides additional location data to emergency responders, such as street address and floor inside a building. Carriers have a deadline to implement all phases of e911, which includes extended data from wired phones, and the location (within 1,000 feet) for cell phone users. The FCC's deadline for implementing this system is October 2005.

Residential VoIP service provider Vonage last year made 911 tracking possible for its customers through a partnership with a 911 telecom services firm. For a company, one of the so-called "blessings of VoIP" turns out to be a curse in terms of e911.

IP phones can be moved easily throughout a company, allowing for quick and easy moves and changes. However, this mobility also can make physical tracking of the phones difficult. Then there's the issue of remote workers using VoIP to access a remote PBX.

The nightmare scenario in an enterprise VoIP network might look like this: An ambulance shows up at a corporate office, but the 911 dialer actually is working from home with a IP softphone linked to the office by a VoIP VPN link. This example is extreme, but there are real issues with just getting location information for VoIP users inside a company facility.

Companies with VoIP networks that lack appropriate e911 support could face legal issues from employees if a call made from an IP phone during an emergency is mishandled for technical reasons, according to Mark Lies, a senior member of Seyfarth Shaw, a Chicago law firm specializing in labor issues.

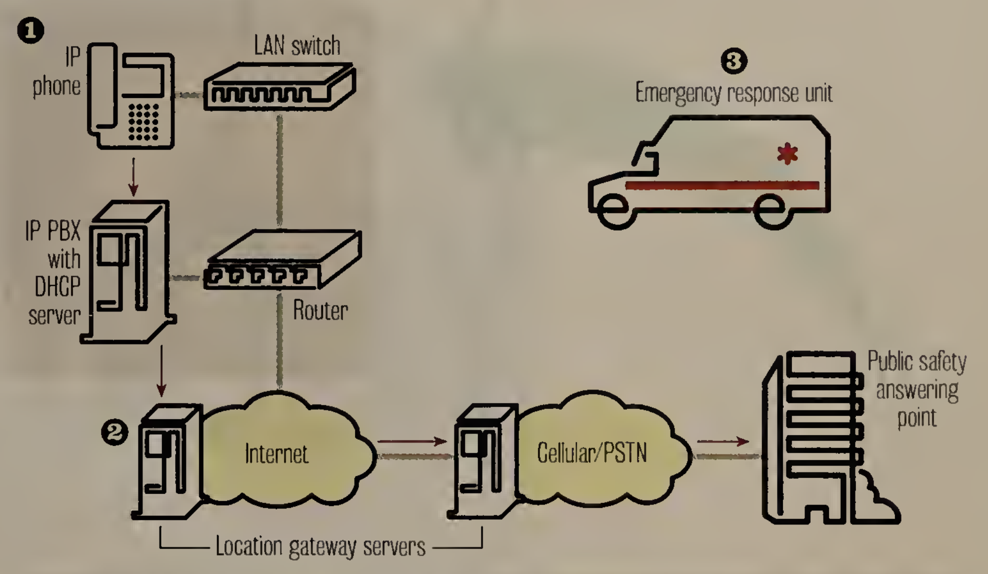
Financial risk

"If enterprise phone systems aren't configured to provide authorities with the exact location of an emergency caller, they could be subjecting their owners to undue financial risk," Lies says.

Methods vary widely among vendors on how to deliver e911 information to approximately 2,000 911 call centers in the U.S., known as public safety answering points (PSAP).

Automating VoIP e911

Nortel's proposal for a VoIP e911 standard would use DHCP tracking and cellular/public switched telephone network infrastructure for location tracking.



❶ 911 is dialed from an IP phone.

❷ The phone's IP address is registered with location gateway servers in a phone carrier's network, which pass phone number and location information to a local public safety answering point.

❸ Help is dispatched with knowledge of the 911 caller's location in a building, within 100 feet.

E911 support exists in Cisco's CallManager IP PBX software, where a phone's locations can be entered into a database manually. The Emergency Responder product is an add-on to its CallManager IP PBX software, which lets the locations of Cisco IP phones be tracked in a database that is updated automatically when phones are moved. This data is then uploaded to a local PSAP database. However, the physical tracing of phone locations relies on Cisco Discovery Protocol, a device-to-device communications technology Cisco Catalyst switches and phones support.

For tracking IP phone locations, 3Com promotes its Network Jack 200 (NJ200) — a small four-port switch installed in cubicles as a wall jack replacement. With network mapping tools, 3Com IP phones can be traced to the NJ200 outlets they are plugged into, giving emergency responders the location of a 911 call. But again, this requires 3Com phones and NJ200s installed throughout a company.

Makers of IP PBXs with legacy PBX product lines mix old and new technologies to deliver e911. One option on Avaya and Nortel equipment links the ranges of IP addresses the IP PBX hands out to IP phones and to phone extension numbers in a database. When 911 is dialed from an IP phone, this data is sent to the PSAP via a separate ISDN line that is linked to the telephone provider's central office.

Users adapt

Users with VoIP networks are adapting to e911 as best they can.

"Right now we're not doing anything with e911," says Gary Vandertoolen, network and telecom manager for the University of Utah Hospital (UUH) in Salt Lake City, where more than 700 3Com IP phones are deployed throughout several buildings.

When 911 is called, the hospital's phones are configured to dial a university campus security office, which responds to emergencies and relays calls to local PSAPs for responding. 3Com NBX IP PBXs in each building register with the campus security office and give the 911 PSAPs building and address information.

UUH is tackling the project of making the automatic availability of more detailed e911 information in parts.

"The way we're hoping to get this to work is that each one of our phones has a [media access controller] address that we'll tie to a [phone] extension," Vandertoolen says. "We're looking at some tools

See E911, page 22

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TOLLY ON TECHNOLOGY

Kevin Tolly

Putting the 'enterprise' into wireless LANs

As wireless LANs have rocketed into the consciousness of corporate managers in the past year or so, existing and prospective vendors in that space have been quick to point out how not to build a WLAN. Stay away, they say, from the temptation of building your network using a shopping cart full of those $100 access points from your local Circuit City. Enterprise WLANs need more. Recent examples prove the case.

While a basic, single access point WLAN servicing a handful of clients is simplicity itself, expanding that network with a second access point to handle a few more clients over a little larger area causes an immediate spike in complexity.

With one access point, roaming is a non-issue, selection of the radio frequency channel for the access point is mostly arbitrary, and performance is likely far less important than just the ability to work untethered. Scaling to enterprise level, though, these and other issues arise. Some can be resolved with overprovisioning and careful RF planning. Others require technology solutions that go well beyond what can be had in "plain vanilla" 802.11b/a/g standard gear.

Two recent projects of mine, although hardly the only examples, provide some good insights into the types of innovation that are defining true enterprise-class wireless solutions.

Like Airespace, Meru, NEC and some others, Airflow Networks has a vision that is tightly coupled with the emergence and integration of voice and wireless. The company sees both hard-wired VoIP traffic becoming wireless and the majority of our mobile phones soon becoming equipped with 802.11 technology and being able to hop onto our corporate LANs.

With voice on the network, the issue of roaming — your WLAN traffic being handed off from access point to access point as you move about the building — becomes critically important. Where the signal degradation and "re-association" process of "standard" roaming are of little consequence when you're walking down the hall with your laptop under your arm, they can be more than a nuisance if the wireless device is a phone at your ear.

To deal with this, AirFlow completely rethought the access point implementation process (among other things). The company's "distributed access point" approach lets many distributed radios appear to the client as one access point. This, coupled with intelligence that lets AirFlow's WLAN switch determine the best radio to use at any moment, removes the re-association need from the clients along with providing hand-off between radios without packet loss that is below 10ms even under load. Thus users are assured enterprise-class handling of their voice-over-WLAN calls.

Meanwhile, wireless chip vendor Engim has focused on a severe but little-recognized performance bottleneck inherent in all previously available standards-based products. And it is one that only gets worse as WLAN speeds increase. A recent Network World Fusion story provides details — www.nwfusion.com, DocFinder: 1529.

Engim's essential insight was that at any given instant, overall throughput of a WLAN access point was throttled by the transmission speed of its current user. With 802.11g systems being able to service, say, 802.11b clients that were at the fringe of its coverage, that communication could be taking place at 1M bit/sec. And because clients of access points were rarely all in "optimal" range, some degradation was likely always taking place. By using three channels at once, and separating out users into their appropriate "lane," Engim increased overall access point throughput by up to 50 times.

So yes, there is such a thing as enterprise-class WLAN technology. Make sure that you spend the effort required to learn about it.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com.

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E911

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that will go out and pinpoint where each MAC address is physically located and show what switch port it is coming out of." UUH also deploys 3Com Network Jacks, which have MAC addresses that could be mapped to a phone's physical location.

Because UUH uses Foundry Networks switches, Vandertoolen might use a Foundry tool for port tracking and creating network maps. A network mapping and MAC address tracking tool from InMon also is being evaluated, he says. Specific physical locations based on these maps — such as "second floor, east" — then could be transmitted to e911 PSAPs.

"It's something that we know can be done," Vandertoolen says of VoIP/e911 support. "But we just have to find the resources and time to do it."

The Nortel standard

Nortel this March proposed a standard to the FCC for standardizing the way e911 data is registered, and delivered to PSAPs over VoIP networks. The rough-sketch technology outline proposed the use of cell phone 911 location infrastructure, in conjunction with Dynamic Host Configuration Protocol (DHCP) servers in corporations, service providers and public premises that offer VoIP services.

Many companies use specialized service providers or make agreements with their telcos to pass e911 location database data to PSAPs, says Mark Lewis, a senior consulting engineer at Nortel who is involved in crafting the VoIP/e911 proposal.

"Those records often have to be loaded or faxed" to telcos or directly to PSAPs, Lewis says. "This is a manual process today."

The Nortel proposal would borrow location database infrastructure from the cell phone networks' 911 system, which automates the delivery of e911 and location data to PSAPs, Lewis says.

Cell phone network equipment uses routing keys with location information and geospatial tracking technology. When a 911 call is made from a cell phone, the number is matched to the location key that is sent to the PSAP, which gives responders a relative geographical reference for the caller.

Although the details are still to be determined, the VoIP/e911 system would have a DHCP server in a VoIP network register its location with a local cell phone switch. New devices to be added to the network — which Lewis describes as "location gateway servers" — would act as a relay between DHCP servers on VoIP networks and the cell network. This would allow the automatic updating and delivery of location information to PSAPs, Lewis says. He says Nortel is working with the IETF to create a standard around this concept.

Whether the Nortel proposal ends up as a standard depends on how the carriers, many of whom are slow to recognize VoIP, will accommodate.

"Carriers were supposed to have complied with e911 for cellular, but they are lagging behind what the FCC wants," says Ron Gruria, an analyst at Frost and Sullivan. "Enterprises take [e911] seriously because many have to have it."

And for corporations to comply, it's still every man for themselves, he adds.

"There are lots of workarounds, but no standard way to solve this problem," he says. ■

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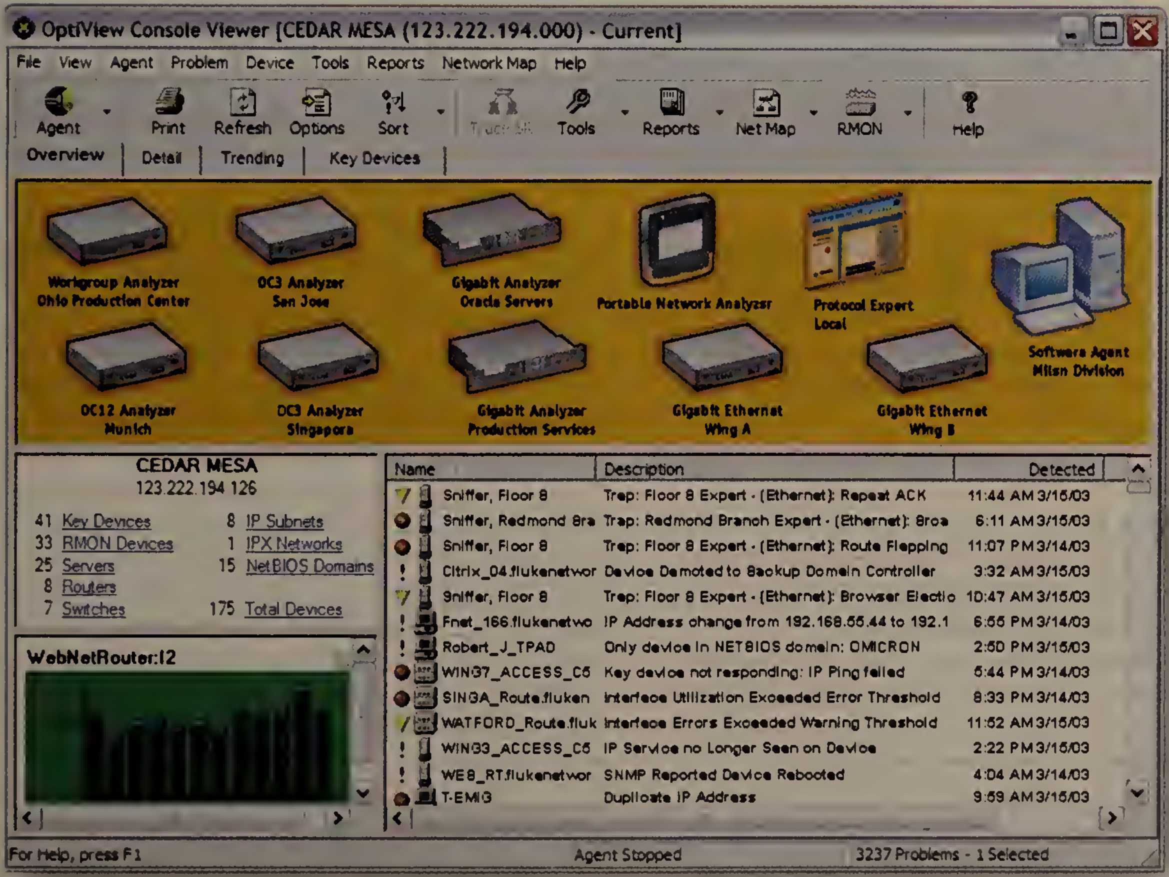

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Name	Description	Detected
Sniffer, Floor 8	Trap: Floor 8 Expert - (Ethernet): Repeat ACK	11:44 AM 3/15/03
Sniffer, Redmond Bra	Trap: Redmond Branch Expert - (Ethernet): Broa	6:11 AM 3/15/03
Sniffer, Floor 8	Trap: Floor 8 Expert - (Ethernet): Route Flapping	11:07 PM 3/14/03
Citrix_04.flukenetwor	Device Demoted to Backup Domain Controller	3:32 AM 3/15/03
Sniffer, Floor 8	Trap: Floor 8 Expert - (Ethernet): Browser Electio	10:47 AM 3/15/03
Fnet_166.flukenetwo	IP Address change from 192.168.55.44 to 192.1	6:55 PM 3/14/03
Robert_J_TPAD	Only device in NETBIOS domain: OMICRON	2:50 PM 3/15/03
WING7_ACCESS_C5	Key device not responding: IP Ping failed	5:44 PM 3/14/03
SINGA_Route.fluken	Interface Utilization Exceeded Error Threshold	8:33 PM 3/14/03
WATFORD_Route.fluk	Interface Errors Exceeded Warning Threshold	11:52 AM 3/15/03
WING3_ACCESS_C5	IP Service no Longer Seen on Device	2:22 PM 3/15/03
WEB_RT.flukenetwor	SNMP Reported Device Rebooted	4:04 AM 3/14/03
T-EMIG	Duplicate IP Address	9:59 AM 3/15/03

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Special Focus

INFRASTRUCTURE: Server interconnects.

Technology to tie together servers swells

BY JENNIFER MEARS

For years, Prudential Group Insurance has clustered big, proprietary Unix boxes to power data warehouses that manage volumes of client information. However, the Livingston, N.J., company recently began testing micro clusters of smaller, standard-based systems that run Linux as a possible alternative.

As anticipated, the cluster of five dual-processor Intel-based IBM x345s, connected using an InfiniBand I/O switching fabric, is a less-expensive setup than the two six-way Unix boxes. What's been surprising, though, is the new system's performance.

"I've got basically $30,000 worth of x345s running on InfiniBand, and it's keeping pace with about $650,000 worth of larger Unix nodes," says Don Canning, vice president of IS, who selected InfiniBand because it behaved similarly to the existing proprietary fabric. "I expected it to run about half as fast as the larger Unix [symmetric multiprocessors]."

Prudential is not alone in investigating server interconnects that fall outside traditional Ethernet or proprietary protocols. As businesses move toward utility computing, where resources are pooled and allocated based on application demand, the way the servers communicate becomes increasingly important.

"We still do networking the way we've done networking for years, but the network itself is getting faster. This is putting pressure on the server in terms of using more CPU cycles," says Judy Estrin, former CTO at Cisco. She recently launched Precision I/O, a start-up aimed at removing I/O problems from Ethernet networks.

"As we move to new network computing architectures, we are communicating more. So it's not just that the bandwidth is increasing, but the number of elements in networks exchanging information is increasing as we go to more distributed architectures," she says.

The trouble with Ethernet is CPUs have to handle the TCP offload burden that becomes increasingly heavy as network speeds increase, which pushes more packets in and out of servers. When server clusters are running transaction-based applications such as databases, a slowdown in communication means a dramatic drop in application performance.

Technologies such as Remote Direct Memory Access, which lets servers place information into the memory of other servers, and TCP offload engines deal with this issue. Interconnect technologies such as InfiniBand have been developed to provide alternatives to Ethernet, and to proprietary interconnects from companies such as Quadrics and Myricom.

Analysts say that InfiniBand is emerging as a likely alternative to Ethernet within corporate data centers. But they say business users have been slow to adopt a technology that for the near term likely will only make inroads in niche deployments such as to connect clusters for database applications and business intelligence engines. They add that if Precision I/O delivers on its promise, it might provide an even more appealing option.

"With InfiniBand, you have to make changes to the application and put in drivers. You need new cabling infrastructure," says Arun Taneja, founder of Taneja Group. "So if I can stay with Ethernet and not make any changes, that's motherhood, and you can't argue with motherhood."

And while support for InfiniBand has been rejuvenated lately — InfiniBand switch vendor Topspin Communications has inked partnerships with Dell, HP, IBM and Sun in recent months — Myricom and Quadrics also partner with server vendors. Their technologies are found in many server clusters at research labs and universities. Indeed, of the top 10 supercomputing sites, two used Myricom's Myrinet interconnect, three used Quadrics, one used InfiniBand and one used Gigabit Ethernet. The rest used proprietary interconnects from the systems vendors, according to the list of the Top 500 Supercomputer Sites.

Increasingly, labs and universities are looking at InfiniBand, an initial step that could push the high-speed fabric closer to corporate data center deployments.

Jim Foster, manager of the advanced systems group at the Texas Advanced Computing Center in Austin, says he'll consider InfiniBand as one of several interconnect options as the university plans its next cluster. The center currently has a cluster of 512 Dell servers and opted to use Myrinet when it began building the Linux cluster about two years ago.

"At that time, Myrinet was the de facto standard for high-speed interconnects. Now other technologies are coming along," Foster says.

The fact that InfiniBand switches can support other protocols such as Fibre Channel and Gigabit Ethernet is appealing, Foster explains, because it would let him easily hook the cluster into storage and network systems. Two years ago, Foster says InfiniBand wasn't selected because the cost was too high. But that is changing.

While many InfiniBand vendors closed their doors two years ago when support for the technology waned, a handful remain, including Voltaire, Topspin and Infinicon.

"There are multiple companies doing development on InfiniBand, and that will tend to drive volumes up and costs down, which could give it an advantage," says Gordon Haff, an analyst at Illuminata. "Today, though, it doesn't really have any huge advantage over Myrinet."

Connect the dots

As customers begin tying together multiple low-end boxes in grid and cluster configurations, how those nodes communicate with one another becomes increasingly important. A look at some interconnect options:

	Speed	Price per port
InfiniBand	2.5G, 10G and 30G bit/sec	$250 to $1,000
Myricom's Myrinet	2G bit/sec; scales to 10G bit/sec	$300 to $550
Quadrics' QsNet	7.2G bit/sec	$2,000
Gigabit Ethernet	1G bit/sec	$200
10 Gigabit Ethernet	10G bit/sec	$7,000

> **"We're aware that as we do more clustering and expand the grid, we may need to look at making sure that the server-to-server interconnect does not become a bottleneck."**
>
> **Ruth Harenchar**
> CIO, Bowne & Co.

Don't count out Ethernet

10G Ethernet also is starting to get more attention as companies such as S2io roll out products to support it in servers. Pricing for 10G Ethernet switches continues to fall and is now about $7,000 per port, compared with about $100,000 per port when the technology debuted about three years ago.

Ruth Harenchar, CIO at financial publishing firm Bowne & Co., says her team is investigating interconnects such as InfiniBand, but today Gigabit Ethernet handles server-to-server communication just fine. The New York company rolled out its first grid last year.

"We're aware that as we do more clustering and expand the grid, we may need to look at making sure the server-to-server interconnect does not become a bottleneck. But so far we haven't had to invest in that," she says.

Bowne says 10G Ethernet also could be an option. But analysts note that 10G Ethernet would face the same kind of I/O bottlenecks that Gigabit Ethernet faces today.

"Ten Gigabit Ethernet will up performance, but it still will suffer from latency issues that Gigabit Ethernet suffers from in general," Taneja says.

Analysts say Remote Direct Memory Access (RDMA) will be incorporated into 10G Ethernet to address the issue, but note that users likely won't see benefits from that for at least a year.

"The question is how quickly can InfiniBand ramp up and how quickly can 10 Gigabit Ethernet get RDMA," says Jim Pappas, director of initiatives marketing in Intel's advanced components division.

In the meantime, business customers should keep an eye on the performance and pricing of different interconnect options. Systems vendors recognize the growing importance of interconnects in corporate deployments. Sun, among others, is setting up interconnect labs to get a better understanding of the pros and cons of the technologies and where each is best suited. The trend toward tying together multiple low-end systems is pushing interest in InfiniBand, says Shahin Kahn, vice president of high performance and technical computing at Sun.

"There is definitely an increased interest in InfiniBand," he says. "But I hasten to add that there is increased interest in interconnects in general." ■

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Software enhances digital rights mgmt.

BY JOHN FONTANA

Rights management vendor Liquid Machines last week released the latest version of its data-protection software that lets customers extend corporate document access controls to partners and suppliers.

Liquid Machines 2.0 pushes rights management features past the firewall, letting firms use rules and roles defined in the Liquid Machines server to control the creation and enforcement of access rights that dictate who can access and alter documents and how long they can access them.

"One issue that we have waited for is interoperability with extended clients," says an IT project manager at a large consulting firm who asked not to be identified. "In the past we found nothing that would protect editable documents. You could encrypt and decrypt, but you had to trust the user once the document was decrypted."

The project manager says he is piloting Liquid Machines to help secure documents that are shared with an outside client.

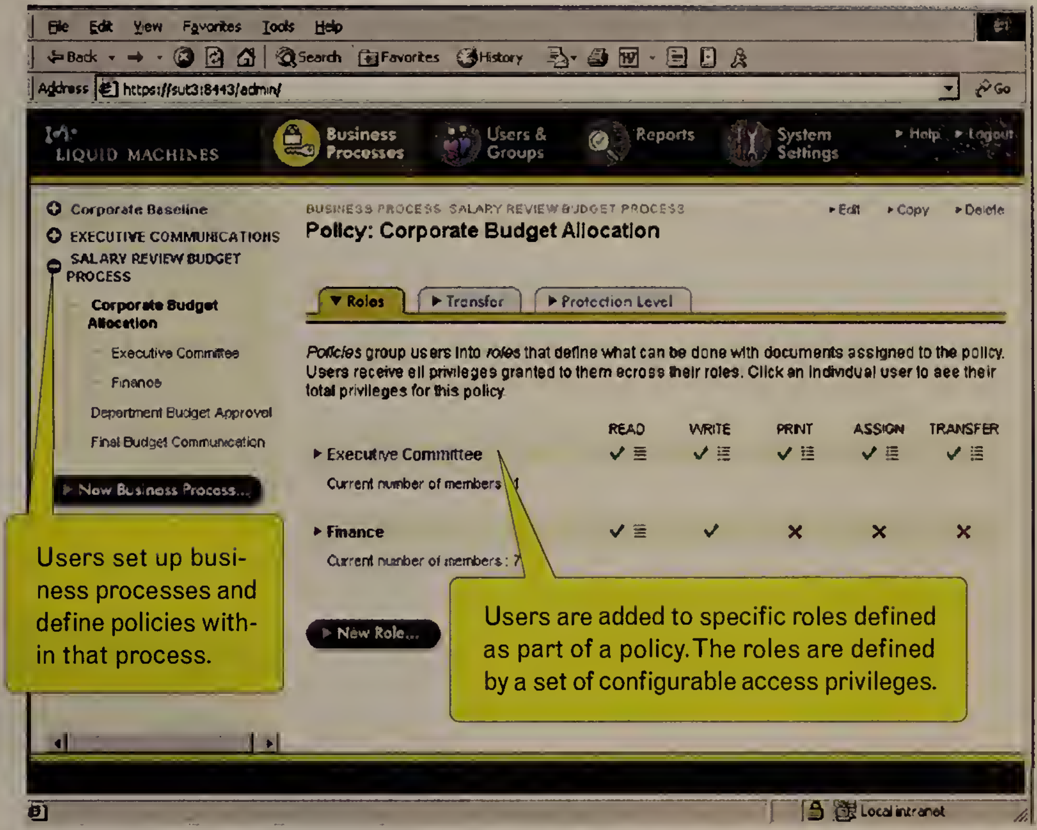
"We think the technology is at the point where we can get rolling," he says. "Liquid Machines doesn't require a lot of thinking by end users. It doesn't interfere with the way they work, and that is the key."

The software lets companies control use of a document based on a set of policies on the Liquid Machines server. The policies are pushed to client-side software that acts as a shim between the application and the operating system. When the user tries to open the document on a desktop, the client

See Rights, page 28

Policy manager

Liquid Machines has released Version 2.0 of its software and has added the capability to assign digital rights based on pre-configured roles.



BUSINESS PROCESS SALARY REVIEW BUDGET PROCESS

Policy: Corporate Budget Allocation

Policies group users into *roles* that define what can be done with documents assigned to the policy. Users receive all privileges granted to them across their roles. Click an individual user to see their total privileges for this policy

	READ	WRITE	PRINT	ASSIGN	TRANSFER
Executive Committee Current number of members 1	✓ ☰	✓ ☰	✓ ☰	✓ ☰	✓ ☰
Finance Current number of members : 7	✓ ☰	✓	✗	✗	✗

Users set up business processes and define policies within that process.

Users are added to specific roles defined as part of a policy. The roles are defined by a set of configurable access privileges.

Short Takes

■ **Microsoft** this month will hold the first meeting of a new council it formed to address radio frequency identification opportunities. **The Microsoft RFID Council** will consist of end users and hardware and software vendors building RFID systems on Microsoft's platform. Manufacturers, distributors and retailers are eyeing RFID as a means to better track and manage inventory as it passes through supply chains. And vendors such as Microsoft are looking for ways to make their products part of systems for collecting, managing and integrating RFID data. Participating vendors include **Accenture, GlobeRanger, High-Jump Software, Intermec Technologies, Manhattan Associates** and **Provia Software.** Microsoft also announced last week that it joined **EPCglobal,** an organization driving the development of standards for RFID technologies.

■ **Ipswitch** last week added more anti-spam filtering mechanisms to its **IMail Server.** New are Word Normalization, which removes creative punctuation such as spaces between letters before mail is filtered, and Advanced White List filtering, which uses trusted addresses and domains to reduce false positives. The company also added Single Message Identification, which helps track messages, and Single Line Modification, which flags a message as spam. The new filtering technologies are available as a free download from www.ipswitch.com.

Security vendors bolster line of defense

BY ELLEN MESSMER

IBM, Network Associates and Symantec each disclosed plans last week to beef up their security product lines to provide more defense for networks.

IBM's Tivoli division next month plans to ship its first host-based policy-compliance scanner for desktops, servers and mainframes, which promises to help customers check for weaknesses such as unsecure passwords, orphan accounts and unpatched systems.

IBM Tivoli's Security Compliance Manager and its Policy Compliance Checking Tool, which reside on a central server and look for vulnerabilities and compliance violations and report back to a central console, is the outgrowth of a service IBM has offered for about three years.

The product comes with security-policy compliance templates that can be pushed from a central server to networked computers to help comply with government regulations such as the Gramm-Leach-Bliley Act and the Health Insurance Portability and Accountability Act.

The product's options for security settings also will reflect recommendations made by the SANS Institute in its Top Ten Vulnerabilities list and the National Security Agency guidelines, says James Galvin, security product manager at IBM Tivoli.

"Our customers want some way to check compliance in terms of regulations," says Galvin, adding that scans performed by the Policy Compliance Checking Tool are stored in IBM's DB 8.1 database.

Organizations already using host-based compliance-checking and security assessment tools say they help in the constant battle to keep computers patched and password policies enforced.

Mark Day, CTO and deputy CIO at the Environmental Protection Agency, says the federal agency more than a year ago automated the monitoring of more than 1,000 servers, primarily NT and Novell, through use of the host-based scanners from IBM competitor BindView.

"We run [the compliance-checking scan] at random times and we don't announce it," Day says. Much as the IBM software is expected to do, the BindView tool reports back on servers that haven't been kept appropriately maintained. Though some IT staff at the EPA first resented the automated monitoring, they gradually accepted it as a good way to prove how well they'd done their work, Day says.

Security giants Network Associates and Symantec are busy with new products.

Network Associates' McAfee division later this month plans to ship an anti-virus software and management-console package aimed at businesses with 500 or fewer users. The SMB anti-virus package will come with a new central console software, called McAfee Protection Pilot 1.0, instead of the McAfee ePolicy Orchestrator (ePO), McAfee's central console that supports large-scale anti-virus distribution and reporting.

"The ePO was too complex for a lot of smaller businesses," says Steve Crutchfield, product manager at McAfee. In contrast, Protection Pilot 1.0 has a simpler wizard-based installation, policy recommendations, and a "dashboard" with a simple display to show if all machines are up to date

See Defense, page 28

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'NET INSIDER

Scott Bradner

Fast bits as a right for the masses?

President Bush last month pushed "a national goal for broadband technology" that would ensure "universal, affordable access for broadband technology by the year 2007." A laudable goal indeed, but one that we just might have to cross a chasm or two to reach.

Bush brought up this "bold plan for broadband" during a speech to first-time homebuyers in New Mexico (see www.nwfusion.com,DocFinder:1531).The more broadband users there are in the U.S.,"the more likely it is America will stay on the competitive edge of world trade," he said.

The president said having more broadband users would have an effect on innovation in education and the ability "to have interesting new ways to receive doctors' advice in the home." He also said "we don't need to tax access to broadband."

Not to be outdone, presidential candidate Sen.John Kerry (D.-Mass.) has his own plan for making broadband available in urban and rural America by mimicking the successful rural electrification program (see DocFinder:1532). His Web site also notes that "Economists have estimated that widespread, high-speed broadband access could increase our national GDP by as much as $500 billion annually by 2006."

The idea that high-speed Internet access should be a national goal is not new. A number of years ago Congress told the FCC to ensure high-speed access (politicians say "broadband" these days because it's even harder to define) would be available to all Americans in a timely manner.

And I've written on this topic in the past (see DocFinders: 1533 and1534).

Some real problems will have to be overcome to reach anything like Bush's goal, with the biggest one being cost. The FCC found that few people were willing to pay much for high-speed Internet access. Bush's solution is competition to force down prices. Considering what the underlying service costs to provide,it seems competition by itself will be enough.

Just as big a problem, but not often mentioned, is what functionality broadband service will provide. If the broadband pipe is going to drive innovation it cannot be full of filters and diversion valves. What got us to where we are in Internet technology is the ability for anyone to run any application he wants without having to ask permission from ISPs or to pay extra.The pipes have to be able to be open.

Yes, that does raise security risks, but letting pipe providers use mitigation of this risk as an excuse to disable innovation on the part of the users is too high a price to pay. We will not get the benefits of innovation if we are not allowed to innovate.

The other thing that is needed to enable innovation is the ability for users to put up their own servers,such as Web servers,VoIP servers and servers for yet undeveloped applications.This requires users to be able to get enough fixed (not dynamic) IP addresses so they don't have to use network address translators. There are plenty of IPv4 addresses available to provide every connected household with enough fixed IP addresses to more than adequately serve their needs.What's more,the supply of addresses expands more than 4 billion-fold when IPv6 gets deployed.

By all means let's embark on a bold plan for broadband, but let's also do what is needed to ensure that the plan will enable the desired innovation instead of turning Internet users into captives of the carriers and content providers.

Disclaimer: Harvard sees stately progress as bold plans, but has not expressed a view on broadband to all Americans.

Bradner is a consultant with Harvard University's University Information Systems. He can be reached at sob@sob.com.

■ **Read Johna Till Johnson's thoughts on 'Net access for all. PAGE 34**

Gordano offers full Outlook integration

■ **BY JOHN FONTANA**

Gordano, a company that pitches its software as a low-cost alternative to Microsoft Exchange, is updating the package to fully support the collaboration features within Microsoft's Outlook client.

The company has released Version 10 of Gordano Messaging Suite (GMS), which now supports the calendaring, scheduling, tasks, journal, notes and online/offline features in Outlook. Gordano also has added two Mail API providers for address books and message stores. Last fall, Gordano integrated global and personal GMS-based address books into Outlook and support for roaming profiles and search features.

"We are now a genuine viable Exchange alternative with Outlook and multi-platform support," says Ray Warren, CEO of Gordano. GMS runs on Windows, Sun Solaris, IBM AIX and Linux.

Warren says users can eliminate their back-end Exchange servers without disrupting any of the base collaboration features that Outlook users expect in their client software.

"Outlook is today's pervasive e-mail client," says Michael Osterman, president of Osterman Research, which recently found in a survey that 60% of e-mail users have Outlook.

In addition, an Osterman study in November showed that 55% of respondents said they would change their back-end servers if they could keep their front-end client. Swapping out clients requires re-training users.

Exchange sits at the top of the e-mail market and is under attack by other vendors. Last month, top rival IBM Lotus said it had signed up 1,500 new customers, many that had migrated from Exchange. Microsoft ended mainstream support for Exchange 5.5 last year and the server's free extended support ends this December. Exchange 5.5 users must migrate to Exchange 2000 or 2003 or move platforms.

"Companies that are facing decisions on how to manage messaging have a good choice in Exchange 2003, but there is a lot that goes with that, including Windows Server 2003 and Active Directory," Osterman says. He says Gordano, along with other smaller vendors, such as Ipswitch, Mirapoint, Rockliffe, Sendmail and Stalker, provide alternatives for many midsize companies.

Pricing for the Gordano Collaboration Server is about $67,500 for 5,000 users or $13.50 per user. ■

Rights

continued from page 25

software enforces the policies associated with that document. If the user's client software does not support the policy, the document cannot be decrypted. Liquid Machines stores all documents in an encrypted form.

Policies are assigned when a user creates a document. The client software works with any document-creation program such as Microsoft Office or Adobe and adds a drop-down menu of policies to the application's title bar.

The menu forces the document creator to select one of the configurable server-side policies that control access permissions instead of letting the user randomly assign access controls. A policy defined as "corporate confidential" would let executives read or edit a document but not copy or forward its contents.

With Version 2.0 users also can assign policies based on roles, the type of data or other attributes using a feature called Promoted Policy. For example, a stockbroker might automatically have an access policy assigned to any document he creates.

Liquid Machines 2.0 also features upgrades to its logging and auditing features, which now lets data be exported into reporting tools. Also new is a role-based workflow and back-office application support through a set of APIs. Version 2.0 also contains new management tools for help desk and systems administrators.

The company is working with Microsoft to help extend the software giant's Right Management Services beyond the Microsoft platform. Liquid Machines competes with software from Adobe, Authentica and SealedMedia.

Liquid Machines 2.0 is priced between $50 and $100 per client depending on volume. The software also supports Citrix and Windows Terminal Services thin clients. ■

Defense

continued from page 25

with virus signatures. The anti-virus software will guard desktops and Microsoft and NetWare file servers, plus Simple Mail Transfer Protocol (SMTP)-based gateways. Pricing, while not yet set, should be slightly less than a comparable package with ePO.

For its part, Symantec next week will make available the second version of the Symantec Client Security 2.0, its combined desktop firewall, VPN, anti-virus and intrusion-detection software.

Changes include the addition of an optional behavior-blocking mechanism that administrators can use to block outbound e-mail worms that infest a desktop computer before Symantec can prepare an updated virus signature to recognize and destroy it.

"When the worm attempts to mail itself out, Client Security recognizes the behavior is not initiated by the user and blocks the worm," says Gary Ulaner, Symantec's group product manager.

Client Security 2.0 also has a mechanism to ensure the anti-virus protection and desktop firewall is installed, running and up to date before the user can access to the organization via VPN. "We have assured this works with VPNs from Check Point, Nortel and iPass, among others," Ulaner says. If the user isn't in compliance, an auto-remediation process can take place.

Other additions to Client Security include a way to detect adware and spyware that make use of any keystroke or logging programs in order to eradicate it through signature-based updates.

Client Security 2.0 is priced by volume, starting at $43.50 per desktop for 250 users. ■

> **"Our customers want some way to check compliance in terms of regulations."**
>
> **James Galvin**
> Security product manager, IBM Tivoli

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Gric beefs up enterprise offerings

■ **BY CAROLYN DUFFY MARSAN**

Gric Communications this month will update its Mobile Office remote-access system so users can more easily connect to corporate networks using either wired or wireless high-speed Internet links.

The company's new offering is the latest in a series of moves aimed at strengthening its position in the enterprise market. Since its founding in 1994, Gric has focused on aggregating networks for service providers such as AT&T and Infonet, which use Gric to provide Internet access in countries where they don't have network assets.

In December, Gric acquired Axcelerant, which provided broadband VPN services to multinational corporations. In February, Gric enhanced its security offerings with the release of a centralized system that lets administrators set and enforce security policies for remote users depending on their access methodology — T-1, DSL, cable or Wi-Fi.

"Before, we were targeting service providers, and 10 of the world's top 14 carriers are customers of Gric," says Abdel Missa, director of market research and strategic planning for Gric. "But over the last 18 months, we've completely shifted. Now all of our efforts are focused mainly on enterprise customers."

Gric's forays into the enterprise market appear to be paying off, analysts say. Today, the company supports 1,600 corporate customers including Procter & Gamble, Merrill Lynch, VeriSign and Phillip Morris either directly or through its service provider partners. About 40% of the company's revenue is derived from its enterprise accounts, and Gric says it expects that percentage to grow.

"Gric is making headway in the enterprise space," says Keith Waryas, research manager for wireless business network services at IDC. "The demand for secure, remote-access service is big and getting bigger. Anybody that has a mobile workforce needs these services."

Waryas says Gric's approach to security and its ability to offer remote Internet access in 150 countries makes the company stand out.

"Gric has taken a bunch of best-of-breed security components and turned them into a single solution that lays over their remote-access services," Waryas says. "I expect similar offerings from other remote-access service providers because the security aspects of remote access are critical as we move from dial-up to a proliferation of access mediums including cable, DSL and Wi-Fi."

Gric's upcoming version of Mobile Office automates many of the tasks around connecting to a corporate network. It automatically searches for wireless connections and proactively notifies users when they are connected. Users no longer need to configure their VPN connection. Instead, Mobile Office finds the VPN on the user's system and can launch it automatically upon connection.

In addition, the new version of Mobile Office will support General Packet Radio Service (GPRS) for wide-area connectivity. GPRS lets a cell phone user with a compatible phone access the Internet, send and receive e-mail and do other data-intensive tasks.

The Enhancements to Gric's Mobile Office system are good news to Pillsbury Winthrop, a New York law firm that uses the software to support 1,800 mobile users in 16 locations worldwide. Attorneys use Mobile Office to connect via the Internet to the law firm's frame relay network for e-mail and document management applications.

"It's really an ideal tool because it provides a single sign-on and single interface for users to ask for services that are available to them, from low-end dial-up to Wi-Fi service," says Kenji Miyaji, manager of IT operations for Pillsbury Winthrop.

Miyaji says Pillsbury Winthrop saves 30% to 40% per month with the Gric service compared with the law firm's previous remote-access setup, which was a dial-up service using toll-free numbers.

"With telecommunications carriers, the invoice process is very complex," Miyaji adds. "Gric made it easy for us to see what our costs are. They have a very friendly interface for billing and settlement."

Stratex Networks, a San Jose manufacturer of wireless communications systems, uses Gric's Mobile Office system and its new Total Security Protection overlay service to support 300 users.

"One challenge we had was to come up with a provider that had access in incredibly diverse locations. That's the first reason we chose Gric," says B. Lee Jones, CIO of Stratex. "The second reason we chose Gric was because they were conscious about security. Our sales force is dependent on using enterprise applications like e-mail ... and we need the communications to be secure."

Before using Gric's services, Stratex used local service providers and did not have a unified system for remote access.

"We had all kinds of bills," Jones says. "Users were paying for Internet access out of pocket and filing expense forms. It was very unreliable, and we had a lot of end users dialing in over AOL or Yahoo, which didn't meet our security requirements."

With the combination of Gric's Mobile Office and Total Security Protection, Jones says he is confident that Stratex can pass the security audits necessary to meet the Sarbanes-Oxley Act. ■

PROFILE: Gric Communications

Location: Milpitas, Calif.

Founded: 1994

Products: Secure remote-access software and services for mobile workers, teleworkers and branch offices.

2003 financials: $41.2 million in revenue, $1.9 million loss.

Competitors: IPass, Fiberlink

Fast fact: GRIC originally stood for Global Reach Internet Connection, though the company just goes by Gric now.

Short Takes

■ **Alcatel** last week unveiled an addition to the service edge router line it obtained from last year's acquisition of start-up TiMetra Networks. The 7750 SR-7 router, which has seven slots and takes up one-third of a telco rack, is designed for Multi-protocol Label Switching VPN and Ethernet service provisioning. It features a switching capacity of 200G bit/sec full duplex, full system redundancy and 20G bit/sec of I/O capacity, scalable to 40G bit/sec in the future.

The 7750 SR-7 is designed to go up against Cisco's 7513 and 7609 routers, Juniper's M320 and Laurel Networks' ST200. The Alcatel device is scheduled to be available later this month; pricing was not disclosed.

MCI aims to make remote access more secure

■ **BY DENISE PAPPALARDO AND PAUL ROBERTS**

MCI last week said it's strengthening its remote-access service portfolio with offerings designed to better secure communications.

Through a combination of internal development and partnerships, MCI is rolling out anti-fraud, desktop policy enforcement, enhanced secure token support, personal firewall and Secure Sockets Layer (SSL) VPN offerings.

Like AT&T, MCI is working to show that its remote-access offerings are as compelling as those from remote-access specialists such as Gric Communications, iPass and Fiberlink, says Brian Washburn, a senior analyst at Current Analysis.

MCI says by midyear it will make anti-fraud protection available as a standard part of its dial-up and Wi-Fi-based remote-access services. The new MCI Sheriff technology has been designed to spot fraudulent traffic, such as simultaneous sign-ons, users who are over their traffic limit or traffic originating from certain countries.

The carrier says it automatically will block traffic from certain countries, such as Russia, where fraudulent access is more common. However, customers will be able to notify MCI to let traffic through when end users are known to be traveling in such parts of the world.

Also included in MCI's remote-access services now is desktop policy enforcement, which lets an IT manager keep end users from accessing a corporate VPN unless they have a personal firewall or specific anti-virus software running.

The carrier says it's also upgrading its remote-access platform to support Extensible Authentication Protocol (EAP) in the fourth quarter. EAP is designed to ensure that different secure token authentication systems can work together.

MCI also has teamed with Sygate to manage personal firewalls and Aventail to deliver an SSL VPN service. The Sygate-based service is scheduled for availability in May; pricing has not been announced. The SSL offering costs $2,700 per month.

Roberts is a correspondent with the IDG News Service's Boston bureau.

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EYE ON THE CARRIERS

Johna Till Johnson

Who GETS the 'Net?

One of the most interesting issues these days is the right to Internet access. You might have thought 'Net access wasn't a "right," but you'd be wrong.

Some folks are concerned about the "digital divide," which refers to the growing negative impact of being offline. Poor people who lack access to basic communications infrastructure are increasingly shut out of today's digital economy, unable to compete for jobs and educations.

Other folks are concerned about 'Net access for government officials during emergencies. Efforts are underway to retrofit the Internet to provide what's known as Government Emergency Telecommunications Services (GETS). GETS is effectively the telephonic equipment of police lights and sirens. Government officials equipped with special cards and PINs can request and obtain pre-emptive service on the existing telephonic network, ensuring that their calls make it through.

I'm not opposed to either idea in principle (and for the record, I support motherhood and apple pie, too). But beware the law of unintended consequences: While solving one problem, you unwittingly might create a worse one.

Attempts to rectify prior generations' "digital divide" included creating a monopoly U.S. Postal Service in the 1800s and a regulated telephone service in the 1900s. The efforts indisputably worked. Both the USPS and regulated telcos deliver low-cost, reliable service to customers in remote locations who could not otherwise afford it.

The catch is the consequences. As a result of being regulated, both the USPS and regulated telcos have been slow to innovate, kept back from investing in modernizing technologies for decades. It took competition and deregulation to jump-start the industries, which ironically has reintroduced disparities (not everyone can afford broadband or FedEx). Anyone who wants to address the digital divide by mandating subsidized Internet access might want to review a little history first.

What about GETS? The rationale behind it is to use existing commercial infrastructure rather than construct an expensive proprietary infrastructure to do the same thing. In theory, this makes perfect sense — why should the government re-invent the wheel at taxpayers' expense when current infrastructure can do just as well? The problem is that the infrastructure can't, and the government already did.

Ironically, ensuring universal emergency service over the Internet is exceedingly difficult. While the 'Net might stay up during an emergency, there's no guarantee that any individual connection will survive. Retrofitting the 'Net to provide GETS is likely to prove difficult and frighteningly expensive.

And possibly unnecessary. A few years back, the government helped subsidize one of the most expensive and reliable networks in the world — or off it. Remember the Iridium satellite system? It's still there. It's an excellent way to ensure voice and data communications make it through.

The bottom line is allaying the "digital divide" and ensuring reliable emergency service are worthy goals. But it matters a great deal how those goals are achieved.

Johnson is president and chief research officer at Nemertes Research, an independent technology research firm. She can be reached at johna@nemertes.com.

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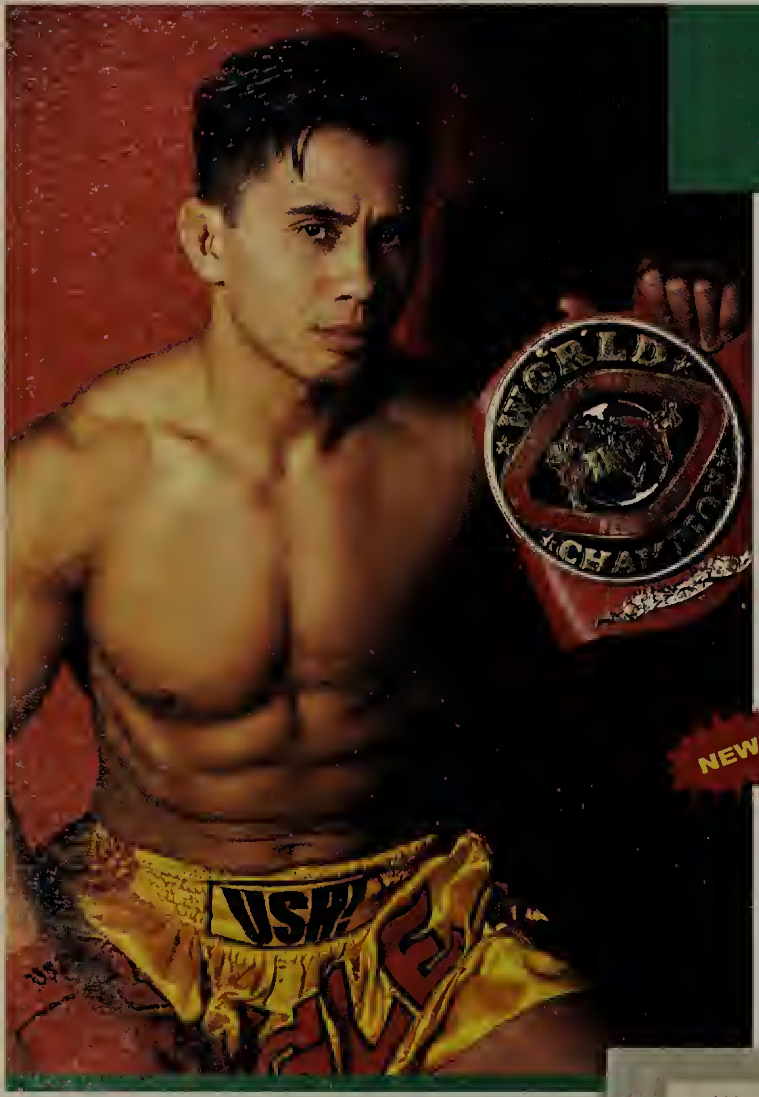

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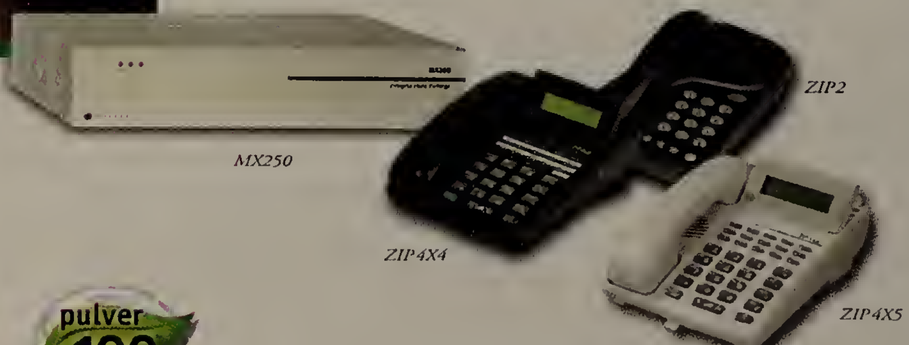

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Net.Worker

■ PRODUCTS, SERVICES AND STRATEGIES FOR TYING TELEWORKERS TO THE ENTERPRISE

Satellite broadband improves for teleworkers

■ **BY TONI KISTNER**

We're at a point where most business people take home-office, high-speed access for granted. But teleworkers and salespeople who operate beyond broadband's reach remain a problem. Although small in number, these users generate a high volume of support calls when they try to remotely access the same network applications as their broadband-equipped colleagues.

Satellite broadband service looks like a big improvement over dial-up. Providers offer ubiquity, giving firms the ability to put all remote workers on the same bill. Newer ka-band technology allows for higher-speed, bidirectional connections and obviates the need to pay for an additional analog line for data uploads.

Yet, the satellite broadband market remains stifled, despite steady growth in remote work. The top two providers, Hughes Network Systems and StarBand, serve only about 200,000 users combined, according to a recent Gartner report.

The cost of customer premises equipment and installation is one cause. But more to blame are performance problems in technology that relies on transmitting signal to a satellite 22,000 miles away. Another big problem is satellite broadband's incompatibility with IPSec VPNs.

Years ago, service providers developed techniques that speed performance and minimize the half-second signal delay that causes pages to load so slowly. Spoofing, or TCP acceleration, tricks a client application into making data send and receive requests to the server before it has made a connection. "Prefetching" loads Web pages all at once, rather than waiting for the client to request components individually.

But for spoofing in particular to work, it needs to see the source and destination of data packets to ensure the connections sync. Because IPSec VPNs hide this information in the encryption layer, the connection knocks down to dial-up speeds.

However, user experience varies. J.P. Carcenac, systems engineering manager with NetScout Systems, has used StarBand to sync up his Microsoft Outlook and SalesLogic clients from airports, various corporate offices and his office in Woodstock, Ill., for two years.

Initially, he couldn't get NetScout's Cisco VPN client to work at all, but upgrading the VPN software solved the problem. With the VPN turned on, Carcenac reports little degradation in download times, but says "interactive applications like Web pages are rather painful regardless of VPN or not."

In contrast, Kyle Rather, SCADA/controls engineer for Tuscarora Gas Transmission Company in Reno, Nev., has experienced extreme performance degradation using a mix of IPSec and Secure Sockets Layer (SSL) VPN clients. (SCADA, or Supervisory Control and Data Acquisition, is systems software used in industrial processes like steel making.) Rather recently set up a network of StarBand-connected PCs that a crew of contractors from different companies used to access their networks.

But because the contractors used a mix of VPN clients, "connections were dreadfully painful," Rather says. "The clients killed the compression algorithm StarBand used, which gave our users 12K bit/sec to 20K bit/sec VPN connections upstream and down. It was easier to set up a few free e-mail accounts and have mail sent there."

Overall, 15% to 40% of satellite broadband users are corporate teleworkers, according to Hughes. To eliminate the need for a remote-access VPN, Hughes has provided its accounts — mainly those in the pharmaceutical and automotive industries — with dedicated bandwidth over a private network connection.

But a year ago, these customers began pushing Hughes for a way to use their VPNs. "Everybody wants standard IP services. No one wants to do anything special for any network provider anymore," says Emil Regard, vice president of strategic marketing for the North American division of Hughes.

So Hughes developed TurboVPN, software for its DirecWay service that uses satellite acceleration techniques, including spoofing, in conjunction with an IPSec VPN.

Spoofing typically takes place on an end user's satellite terminal, or VSAT, which conflicts with VPNs. TurboVPN is software residing on the user's PC that connects to an acceleration server on the corporate network. This way, spoofing takes place on the client before the data is encrypted and then again on the acceleration server, before the data is encrypted and sent back to the remote site. Regard says TurboVPN increases throughput and response time for intranet and e-mail applications three to five times.

Expected to be finalized next month, the TurboVPN client is in beta-testing with three Fortune 500 companies — two existing and one new customer — all of which declined to be named. The first two pilots, in manufacturing and automotive, involve about 1,000 remote salespeople. The third, an insurance company, will include thousands, Regard says.

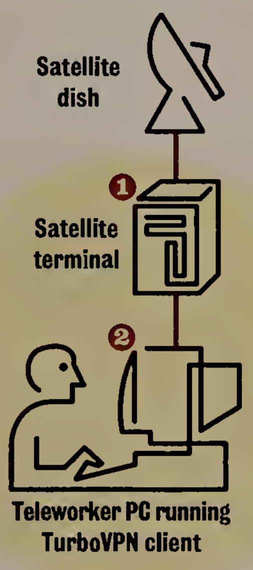
Rather than sell a teleworker/VPN branded product, Hughes plans to integrate TurboVPN with VPN clients from Check Point, Cisco and Nortel, with others in the early planning stages. Because the service requires the acceleration server, Regard says the service will "start to make sense" cost-wise for companies with at least 10 to 20 teleworkers. Pricing for bigger companies is handled on a custom basis.

SSL VPNs and application-layer VPNs suffer from fewer conflicts, so Hughes can spoof and prefetch a significant amount of SSL VPN traffic. V-ONE says its SmartGate application-layer VPN software — which is certified by Hughes — delivers between a 5-to-1 and a 15-to-1 improvement over IPSec VPNs. ■

An expanded version of this story can be found at DocFinder: 1536 www.nwfusion.com

Resolving conflict: How Hughes DirecWay TurboVPN works

To increase data throughput over satellite broadband connections, service providers perform several Web acceleration techniques. One of the most effective is spoofing, or TCP accleration. Spoofing tricks a client application into making data send and receive requests to the server before the actual connection has been made. Another is "prefetching," which caches entire Web pages all at once, rather than waiting for the client to request individual components.



① Before, all Web acceleration tasks took place on the teleworker's satellite terminal (or VSAT), the box that connects the router or workstation to the satellite dish. But for spoofing in particular to work, it needs to see the source and destination of the data packets to ensure the connections sync up. Because IPSec VPNs hide this information in the encryption layer on the client system, spoofing can't work. The connection knocks down to dial-up, or slower, speeds.

② To solve this problem, Hughes Network Systems has moved Web acceleration operations from the VSAT into software on the user's desktop and onto a Web acceleration server on the network. Now acceleration takes place before and after the data is encrypted, resolving IPSec VPN conflicts.

Short Takes

■ **Business and residential broadband subscribers** reached nearly 27 million in the U.S. by year-end 2003, according to a new In-Stat/MDR report, "Reaching Critical Mass: The US Broadband Market." Nearly one in five U.S. households subscribed, with cable modems outpacing DSL. Comcast and Time Warner accounted for the majority of cable subscribers, while SBC and Verizon accounted for the majority of DSL subscribers. Fixed wireless broadband came in third.

■ **Intellon** recently announced the acquisition of the engineering team and intellectual property of rival power-line chip developer **Cogency Semiconductor.** The move gives Intellon 95% of the world market for HomePlug 1.0 integrated circuits. Subsequently, Intellon announced it had raised $23.5 million in funding, led by Comcast Interactive Capital, EnerTech Capital and Liberty Associated Partners.

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Technology Update

■ AN INSIDE LOOK AT THE
TECHNOLOGIES AND STANDARDS
SHAPING YOUR NETWORK

NAS gateways allow IP access to SANs

■ **BY TOM JOYCE**

Network-attached storage quickly has been adopted in corporations because IT managers were drawn to NAS appliances' low cost and quick and easy deployment. But the flexibility comes at a price — the more islands of storage that surface, the more they complicate the task of storage management. As a result, many companies have rolled out storage-area networks to consolidate their storage environments.

A NAS gateway bridges the NAS and SAN worlds by connecting IP networks to Fibre-Channel-based storage. These highly optimized file servers help corporations preserve their storage investments.

A shift in storage

NAS gateways not only offer a cost-effective means of consolidation but also lower the cost of adding new NAS applications to a SAN infrastructure.

Implementing a NAS gateway to access SAN storage increases flexibility and scalability, and delivers greater performance by letting administrators mix different classes of storage arrays and multiple tiers of storage, such as Fibre Channel and Advanced Technology Attachment. Unlike a traditional appliance, a gateway is not limited by the storage included within an appliance and can access resources from multiple, high-performance storage arrays on a SAN.

A NAS gateway gives IP-connected clients file-oriented access to block-level storage on a SAN and processes requests from clients via standard file-sharing protocols, such as Network File System and Common Information File System.

When a gateway receives a client request, it translates the request and sends a request for block data to a storage array. The array processes the request and sends it back to the gateway. The gateway then translates the block information to file data and sends it to the client. This process is seamless and transparent to end users.

One distinction between NAS appliances and gateways is how they attach to the storage. NAS appliances connect directly to the storage housed within the appliance.

The NAS gateway, which connects to an IP network, is attached to a Fibre Channel switch that in turn connects to Fibre Channel storage arrays. Using this methodology, the gateway can access storage resources from multiple storage arrays connected in the SAN.

The physical connection from the gateway to the SAN is via 1G or 2G bit/sec Fibre Channel host bus adapters in the gateway. The host bus adapter uses optical cabling to connect to the Fibre Channel switch on the SAN, which also is connected to the storage subsystem.

Once the gateway is physically connected to the SAN, administrators must configure appropriate zoning from the storage array(s) to the gateway. In most cases, storage ports can be shared between the NAS gateway and other application servers on the SAN.

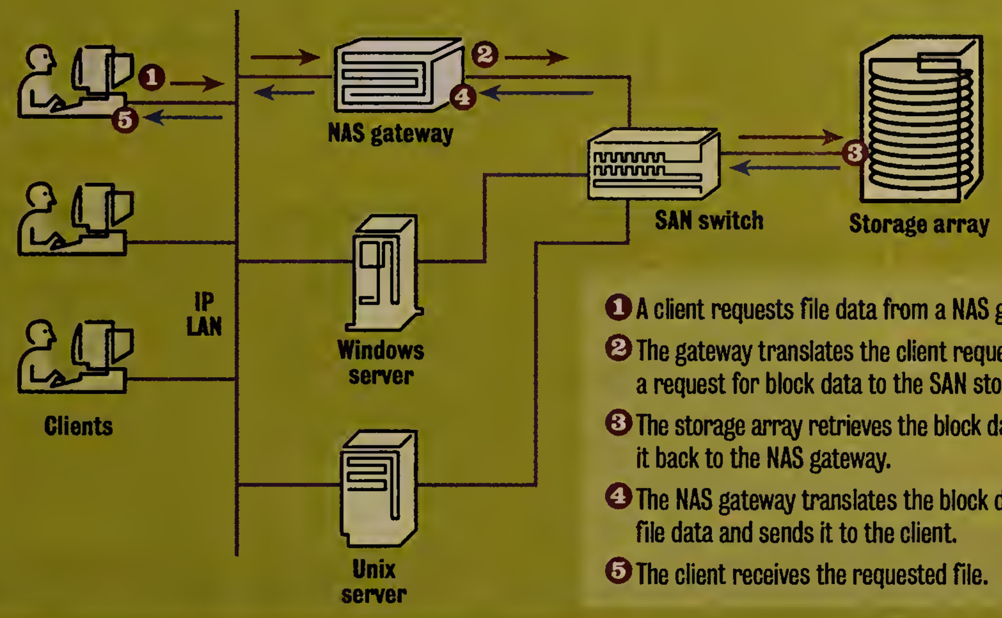
By supporting a variety of SAN connectivity devices, mixing and matching multiple tiers of storage, and using existing management tools for SAN data, NAS gateways optimize and extend the useful life of storage assets. As a result, companies can lower administrative costs, avoid unnecessary hardware purchases and increase utilization of high-end features of a SAN-connected storage array.

Joyce is senior director of NAS marketing at EMC. He can be reached at joyce_tom@emc.com.

■ **HOW IT WORKS**

NAS gateway

A network-attached storage gateway connects IP networks to storage-area networks, letting users access files from both NAS appliances and SAN arrays.



① A client requests file data from a NAS gateway.
② The gateway translates the client request and sends a request for block data to the SAN storage array.
③ The storage array retrieves the block data and sends it back to the NAS gateway.
④ The NAS gateway translates the block data back into file data and sends it to the client.
⑤ The client receives the requested file.

Got great ideas

■ *Network World* is looking for great ideas for future Tech Updates. If you want to contribute a primer on a specific technology, standard or protocol, contact Amy Schurr, senior managing editor, features (aschurr@nww.com).

Ask Dr. Internet

By Steve Blass

Our Linux server (running IBM's Apache 2-based HTTP server) is having trouble installing PHP support so we can try the PHP-Nuke content management software as a customer service portal. We can't get Apache to load the PHP module by following the PHP instructions. Any suggestions?

The PHP Install file directs Apache 2 users to documentation available at www.nwfusion.com, DocFinder: 1535, where instructions for enabling the PHP4 module suggest adding a 'LoadModule php4_module libexec/libphp4.so' line to your Apache httpd.conf file. Change 'libexec' to 'modules' and make sure there is a copy of libphp4.so in the Apache server's modules directory. Installing PHP from source code on your Linux server will ensure that all PHP components are in the right place. Then add an 'AddType application/x-httpd-php.php' line to Apache's httpd.conf file before restarting the Web server.

You can test your installation with a test.php file containing this: <?php echo '<p>Hello World</p>'; ?>. When installing PHP-Nuke, you might need to adjust the SQL installation script 'nuke.sql' and edit the config.php file. To edit the PHP-Nuke home page once it is running, create and log on to the admin account. Then view the home page, and you will see the 'Edit' link at the bottom.

Blass is a network architect at Change@Work in Houston. He can be reached at drinternet@changeatwork.com.

Making Outlook do what we want

GEARHEAD
INSIDE THE NETWORK MACHINE
Mark Gibbs

We finally decided to address something that has been bugging us for a while — to wit, figuring out how to launch applications from a Microsoft Outlook appointment or a task list item. When you think about it, this is a really obvious and useful thing to be able to do and much more elegant in many ways than using the Windows scheduler. Like the idea? Good, then let us begin …

To run an application from Outlook as we intend we need to add a Visual Basic for Applications script, which, in turn, requires that we have installed VBA support in Office. But if you have your Outlook security settings set to "kill" (high) rather than "stun" (medium) you will need to make some changes.

And you might have noticed that Outlook's security in Office 2003 is much tougher than it used to be. If you've run a utility such as Infuzer, which places the local weather forecast for the next five days in your Outlook Calendar, you will be aware that Microsoft's security system demands that you confirm that it's OK for Infuzer to perform the update every time it runs. Very annoying.

We just found a utility that appears to fix this. Express ClickYes from ExpressSoft (go to www.nwfusion.com, DocFinder: 1537) sits in the Windows TaskBar and its job, in effect, is to click "Yes" when the Outlook Security Guard opens that dialog box that says a program is trying to access Outlook and asks if you want to allow it.

To ice the cake, ExpressSoft includes example code in various languages that lets you switch ClickYes on and off. Outstanding, and it is free. Thank you, ExpressSoft.

Anyway, when you open Outlook and you have macros defined, you will get a warning unless you have switched to low security. This is because macros can be big security risks to Office applications, and hackers have used them as a platform of worms. So what you need to do is get Outlook to trust your macros and only complain when it finds a macro from an unrecognized source. So we are going to "sign" your macros.

We start by launching Windows Explorer and navigating to the Office directory (usually "C:\Program Files\Microsoft Office\OFFICEnn," where nn is the release version — Office 2003 is release 11). In this subdirectory you will find selfcert.exe — go on, run it! Selfcert.exe generates a self-signed digital certificate. All you need to do is enter a name for the certificate and click "OK," and you should get a message indicating that a certificate was created (see DocFinder: 1538).

Next you need to install your new certificate in the Trusted Root Certification Authorities for your PC. Under Windows 2000/XP use "Run" on the Start menu and launch mmc.exe, the Microsoft Management Console utility.

From the File menu click "Add/Remove Snap-In" and then click "Add." In the resulting list, select "Certificates" and click "Add" at the bottom of the dialog, and then click on "My User Account," "Finish," "Close" and finally "OK." You are now back in the main window of MMC, so expand the branch:

Console Root\Certificates — Current User\Personal\Certificates

Under the leaf of the branch above, you should find the certificate you just created. Now you have to right click and then drag and drop this certificate to the branch:

Console Root\Certificates — Current User\Trusted Root Certification Authorities\Certificates … and when you release the mouse you must select "Copy here" rather than "Move here" — the certificate needs to be in both locations. (Stick with us here, we're almost done.)

Next close Outlook if it is open then restart it so Outlook recognizes the new configuration. Now run the Visual Basic Editor (on the Outlook menu bar go to "Tools | Macro | Visual Basic Editor") and in the editor window select "Tools | Digital Signature" and click "Choose" and select the certificate you have just created. Now click "OK" and restart Outlook, which lets the new settings take effect.

When Outlook starts this time you will see a new dialog that informs you that the macro has been signed with an untrusted certificate, so you should check "Always trust macros from this source" and then click on "Enable macros."

Now when you start Outlook in the future you won't get any warnings. Easy wasn't it? No … the only thing we didn't have to do was sacrifice a chicken.

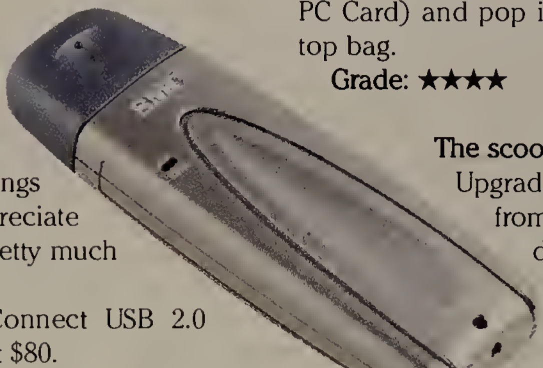
No matter. We now can get on with extending Outlook … and we're out of space.

Next week, we'll cut some code. Overwhelming excitement to gearhead@gibbs.com.

Cool Tools
Quick takes on high-tech toys
By Keith Shaw

Great things from little gadgets

If you believe the phrase "good things come in small packages," you'll appreciate the following gadgets, which all pretty much fit in the palm of your hand.



SMC's USB wireless adapter was easy to install on a Windows XP desktop system.

The scoop: SMC2862W-G EZ Connect USB 2.0 Adapter, from SMC Networks, about $80.

What it does: Yes, the name is bigger than the device itself. The SMC2862W-G USB 2.0 adapter gives 802.11b or 802.11g wireless LAN (WLAN) connectivity to notebook or desktop systems. Just plug it into an available port (SMC offers an expansion cable in case it won't fit directly into the port). If you're using Windows XP or 2000, the drive should activate automatically; otherwise you'll need to install a driver from the CD-ROM.

In addition to 802.11b/g connectivity, the device (about the size of a stick of gum) supports 64- and 128-bit WEP encryption, 802.1x authentication and Wi-Fi Protected Access security.

Why it's cool: We were impressed by how easy it was to install the device on one of our XP desktops, and to run the utility that helps you set up your wireless settings. As many new notebooks now include built-in WLAN features, the USB device would be helpful only on older laptops, or if you wanted to connect to an 802.11g system and your laptop only supported 802.11b. For mobile warriors with older laptops, this USB stick is easy to carry (even smaller than a PC Card) and pop into your laptop bag.

Grade: ★★★★

The Bonzai Flash Drive gives you the freedom to mix form factors for storage.

The scoop: Bonzai USB 2.0 Upgradeable Flash Drive, from Simpletech, price depends on memory configuration — from $30 (no card) to $360 (512M bytes).

What it does: The Bonzai USB drive merges a USB flash drive form factor with a Secure Digital or MultiMedia card (MMC) to provide easy storage options. With the MMC or Secure Digital card inside the device, you plug into a USB port, and the Bonzai loads as an extra hard drive. Simpletech also bundles StorageSync (backup, restore and synchronization tools) and PhotoRescue (retrieve photos from corrupted media cards) software.

Why it's cool: We don't like being tied to one form factor when it comes to storing our files. This device lets us take data stored on our MMC or Secure Digital cards and transfer them to our PC via USB, which works when we don't have an Secure Digital or MMC card reader on our PC. Another plus — as MMC and Secure Digital cards get more memory, the Bonzai USB device will still work. You just need to insert the new card into the USB frame.

Grade: ★★★★★

The scoop: ReelQuick Retractable Ethernet Cable, from Iogear, $20.

What it does: Not just for phone line cables anymore, these ReelQuick cables help mobile travelers be cleaner with their cabling. No more rubber bands, twist-ties or other methods for wrapping cables. With a quick tug, the cables retract for easy storage. In addition to the Ethernet cabling, the ReelQuick line includes this concept for USB and FireWire (IEEE 1394) cables, and standard phone line cable (for people who still use dial-up).

Why it's cool: At first, we were excited at the possibility of cleaning up our cable clutter because we have a long Ethernet cable that sits in the middle of our living room when we're not using our laptops. But then we realized that the ReelQuick cable is only about 5 feet long; not long enough for where we wanted to work.

Iogear's retractable Ethernet cable helps do away with clutter, but a longer cord would add to its appeal.

At hotels with high-speed Ethernet, a cable is usually provided, but in cases where the cable is missing (or the previous person stole it), this cable can be a valuable backup.

Grade: ★★★

Shaw can be reached at kshaw@nww.com.

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ON TECHNOLOGY

John Gallant

I need you! (For advice and guidance)

There's an old proverb that you should never give advice unless asked. I'll leave you to ponder the wisdom of that adage while I ask for your advice — and your involvement. I'm working on two upcoming events where your input will be invaluable.

First, at the NetWorld+Interop show in May, *Network World* and the Metro Ethernet Forum (MEF) will co-host a customer roundtable on metropolitan Ethernet services. The industry trade group is seeking greater participation from network IT professionals in the development of Ethernet WAN services, and this discussion will be a great way for carriers and equipment makers in the MEF to learn which applications customers think are suited to such services and how they want those services priced and deployed.

If you're attending N+I, are involved in setting your company's WAN strategy and budget, and would like to participate in the roundtable, please drop me a note at jgallant@nww.com. I'll try to make sure there's room at the table for you.

Even if you're not heading to the show, drop me a note with your thoughts about Ethernet in the WAN and what you're looking for from service providers.

Speaking of sharing your thoughts, here's another opportunity. At the CeBit America conference in New York on May 26, I'll be hosting the Network World Wireless LAN Showdown. This will be one of our classic presidential-style debates among leading WLAN product providers, and I'd love to know what you want us to ask them.

We've got a great lineup of traditional infrastructure providers along with the top start-up companies in the WLAN switching market. Cisco, Extreme Networks, Aruba Wireless Networks and Airespace all have agreed to send a top technology executive to the debate, where they'll field questions from *Network World* editors and each other.

With wireless playing an increasingly important role in your enterprise plans, this is a great chance to learn how these companies approach the market in unique ways. How are their products and strategies different? Which solution is most applicable to your applications? Where do they think their rivals come up short?

You can get a taste of the WLAN showdown by visiting our Virtual Showdown, now up and running, at www.nwfusion.com, DocFinder: 1340. Aruba, Airespace and Extreme already are involved, along with three other providers, and the discussion is lively.

Feel free to weigh in online and to offer me some advice about N+I and CeBit America. Thanks.

— John Gallant
Editorial director
jgallant@nww.com

opinions!

Flash and substance

The story "Flash: More than just glitzy Web sites" (DocFinder: 1526) was right on the money in many regards: This powerful (and sexy) language is rapidly becoming far more than the lingua franca of the Web. However, the story says the Flash file format is proprietary.

Macromedia opened the "swiff" format way back in 1998 — quite a while ago in Internet time — and any wannabe Flash developer need only surf to www.openswf.org for all the details on how to read, write and play Flash files.

John Goulden
Bethany, Okla.

In defense of Microsoft

The story "Moving Linux to the desktop" (www.nwfusion.com, DocFinder: 1525) is biased against Microsoft and does little to assist IT managers attempting to make good decisions for their operating environments.

The story says, "The open source option frees you from costly licensing fees." This is only true if you decide to use one of the free versions of Linux. More popular versions that actually provide any support infrastructure have fees that can be more than what Microsoft charges.

The story says, "With Linux, IT can pick and choose what users can access." With Active Directory and Group Policy, Microsoft provides tools to control the user experience more easily than anything I have seen in the Linux environment.

The story says, "Not ready to update or add patches? Linux doesn't force a schedule." Microsoft does not force a schedule any more the Linux does. It can be argued that Linux has just as many security vulnerabilities over the last 12 months as Windows. Top that off with the free tools Microsoft provides for patch management, and from a time and cost standpoint patches are less expensive to manage in a Windows environment than Linux. As Linux develops a substantial market share, hackers will begin concentrating on it as they do with Windows today. The proliferation of differing versions will only add to patching confusion.

The story says, "Especially when considering thin-client deployments, Linux fits in nicely with heterogeneous systems." I fail to see any reason why Linux fits into an environment any better than Windows clients when your story says that there is better hardware/driver support for the Windows operating system.

Stuart Owen
Kansas City, Mo.

Pain, no gain

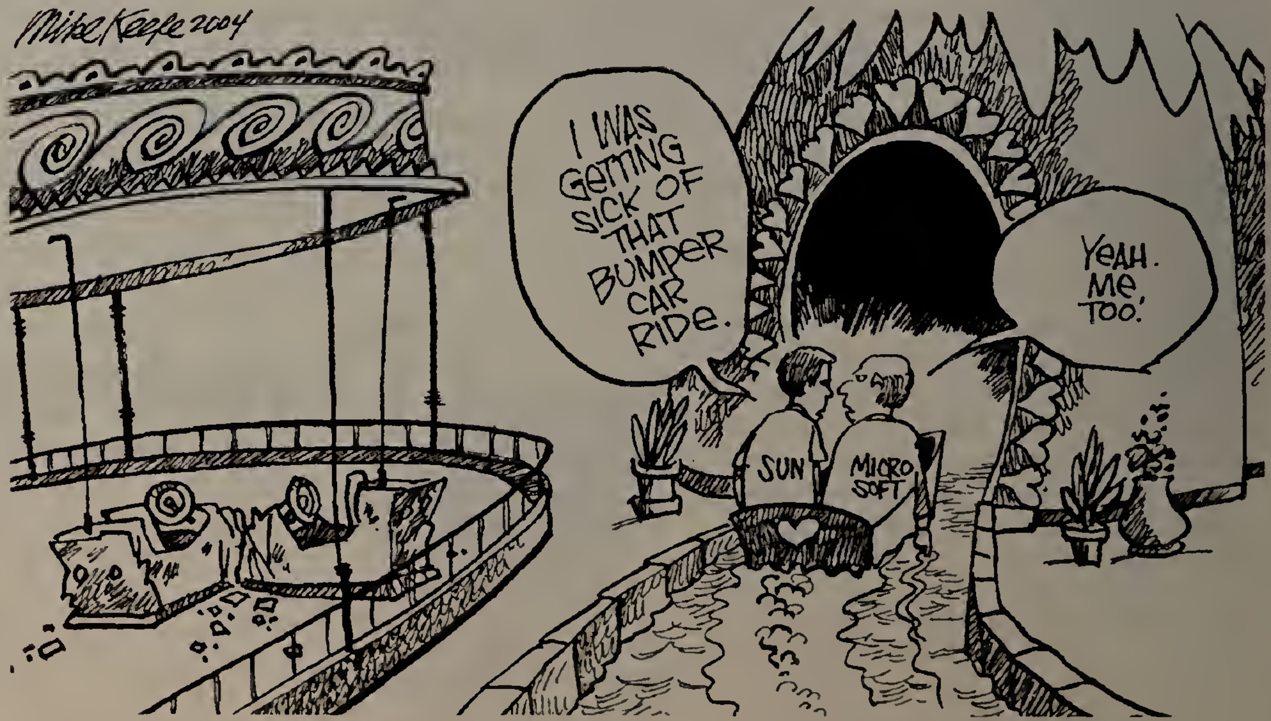
Regarding Thomas Nolle's column "A new dimension to an old rivalry" (DocFinder: 1527): Nolle is very perceptive about what MCI is doing at the edge. I am consulting with a telco, and it slowly is coming to the same conclusion and architectural direction. If all you are going to do is carry VoIP in the core network and then drop to the public switched telephone network at the edges, what have you gained? Answer: cost, technology and tariffing issues.

If you cannot use Session Initiation Protocol to take advantage of new services, there is no operational or expense-reduction advantage. My current experience is that VoIP conversions are implemented only in cases where new locations or major upgrades are required.

Roger Kosak
Chief technical officer
ABSI
Raleigh, N.C.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

More online! **www.nwfusion.com** Find out what readers are saying about these and other topics. **DocFinder: 1524**



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TOTALLY UNPLUGGED

Ira Brodsky

Camera phones are here to stay

Last year, more than 75 million camera phones were sold worldwide. Are they just a consumer fad, or do they have the potential to be a useful business tool?

Camera phones make many companies nervous. They can be used by industrial spies and disgruntled employees to cause irreparable damage. But there are intriguing enterprise applications — most obviously in real estate, public safety, remodeling, insurance adjusting, construction and advertising. Ultimately, camera phones could be used to document work in the field.

But don't expect companies to flock to today's low-resolution camera phones. The typical camera phone has a 300,000-pixel camera — about one-tenth the pixels of a decent stand-alone digital camera. The images look OK on the mobile handset's tiny display. They are slightly fuzzy when displayed at one-quarter screen size on a PC. Prints are simply impractical.

New camera phones with approximately 1.3 million-pixel resolution are being introduced. These models should enable small (perhaps 4 by 6 inches) but reasonably clear prints. More importantly, they open the door to a wider range of applications.

But there is another obstacle to enterprise adoption: lack of picture messaging interoperability between mobile phone operators. Large companies don't want to be limited to one operator for internal picture messaging. Nor would those interested in using picture messaging as a marketing tool want the hassle of supporting multiple standards.

In Europe, virtually all operators adhere to the same standards and interoperability is almost a given. But camera phones and picture messaging would not be as successful today were it not for innovations that sprang from more competitive markets. So far, the overwhelming majority of camera phones have been sold in Asia. In the U.S., Sprint PCS reports subscribers uploaded more than 66 million images last year.

Still, North American operators recognize interoperability could have a multiplying effect on picture-messaging growth, and most say they are determined to make it happen. Multimedia messaging service standards define the packaging and transmission of images; the user interface is left up to individual vendors.

Other issues are confronting camera phones. Higher-resolution camera phones will need flash capability to overcome poor lighting. (Most 300,000-pixel models don't have a flash.) However, the flash integrated with the new megapixel phones tends to be good enough for taking a picture of a nearby person's face but not good for much else. Another problem is that digital camera's zoom capability simply enlarges a section of the original image. A zoom is needed to capture sharp close-ups.

Camera phones pose both threats and opportunities. Savvy companies will realize that camera phones are here to stay, make the necessary security adjustments and look for ways to employ picture messaging for competitive advantage. Banning camera phones is clearly not the answer.

Brodsky is president of Datacomm Research Co. in Chesterfield, Mo. He can be reached at ibrodsky@datacommresearch.com.

North American operators recognize interoperability could have a multiplying effect on picture-messaging growth.

ON SECURITY

Winn Schwartau

Let's end pass-the-buck security

At InfowarCon in 1997, one of the first public debates was held on who should protect the private sector (an economic national security asset) from the "bad guys" — not just from hacking, but also international espionage and terrorism. There were two camps. One suggested that the government should take the protective lead. The other camp said, "No, keep the Feds out of my company. We'll take care of ourselves."

Then came Sept. 11, and the interdependence between all our infrastructures became clear; we are all in this together. So the Department of Homeland Security was formed to be the catch-all of security, including cybersecurity, for the U.S.

In December, Rep. Adam Putnam (R-Fla.), chairman of the House Government Reform Committee's Subcommittee on Technology, Information Policy, Intergovernmental Relations and the Census, released the 2003 federal computer security report card for the U.S. government. The DHS received a failing grade, and the average score for the entire federal government was a dismal D. The Feds failed cybersecurity responsibility for their own systems, yet they want to guide the private sector's efforts (www.nwfusion.com, DocFinder: 1522).

So how much in information security has changed in the last 20 years? Next to nothing, and in many ways, things have gotten worse. Last month, the General Accounting Office (GAO) reported there were 1.5 million reported cyberattacks against government facilities in 2003, a threefold increase over 2002 (DocFinder: 1523).

I speak to senior management across the country, and too many of them feel that the DHS has it covered and that they don't have to spend bottom-line dollars on security. They're passing the buck to the Feds, who are in no better shape and perhaps measurably less responsible than the rest of us.

The GAO and endless other reports cite what we have known for years: Companies need to take responsibility for their own security. We have seen some positive movement in that direction with security awareness, but these efforts tend to be aimed at employees, ignoring the group that can do the most good: senior management.

How many managers understand the real security issues we face, much less are able to discuss the intricacies of their interdependence? How many managers follow the same advice and policy directives they expect their staff to follow? How many managers know their counterparts at competitive organizations who all face the same threats?

What's needed is a rapprochement between competitors within the same industries, and a détente between the government and private sector, each of which have almost diametrically opposed modus operandi. Impossible you say? Not.

Look at the progress made by the Financial Services Information Sharing and Analysis Center (www.fsisac.com). With the cybereconomy being "the economy," according to National Security Advisor Condoleezza Rice, what more compelling an arena to define the necessity of responsible cooperation than the financial infrastructure?

Cooperation means taking responsibility, not passing the buck. It means being willing to take risks with others, share the ups and downs as we learn how to secure the most complex infrastructure ever conceived or built by humans. Cooperation means working with the government, but not abdicating control or responsibility to it.

Under the stewardship of FS-ISAC Chairperson Suzanne Gorman, a foundation for a model of success has been built. But these initial successes will require an intensive ongoing effort at responsible cooperation (often difficult); funding (often distasteful or painful); and the taking of responsibility, something too many of us have forgotten.

None of us have it all right. None of us have it all wrong. But we all have to take and teach the same responsibility we were taught as children: It's your own damn fault if you touch a hot stove again and again.

Schwartau is president of Interpact, a security awareness consulting firm, and author of several books, including Pearl Harbor Dot Com. *He can be reached at winn@thesecurityawarenesscompany.com.*

We all have to take and teach the same responsibility we were taught as children: It's your own damn fault if you touch a hot stove again and again.

The 3Com saga

One-time indust

■ BY JOEL SHORE

3Com turns 25 this June, but the Ethernet pioneer probably won't spend much time celebrating — it's too busy fighting to stay relevant. The last several years have been difficult for the longtime industry mainstay; it's been a dizzying, roller-coaster ride of spin-offs, write-offs, layoffs and strategic about-faces.

Meanwhile, the company's financial position has steadily deteriorated. In 1999, 3Com was a profitable $5.8 billion company; last year it was a money-losing $932 million shadow of its former self. And a return to profitability seems a long way off — 3Com has lost $330 million in the first three quarters of fiscal 2004.

Founded in 1979 by Ethernet co-inventor Bob Metcalfe, 3Com still enjoys enormous brand recognition that dates to its early leadership position in network adapter cards. But the company also has a history of missteps and failed opportunities, including expensive forays into operating system software, analog modems and Internet radio.

In 2000, 3Com made what some analysts say was its most damaging move of all. It walked away from its enterprise LAN equipment business, ceding the market to Cisco, angering dealers, driving away customers and eroding revenue.

Today, 3Com President and CEO Bruce Claflin wants that enterprise business back — and more. Positioning itself as an affordable, standards-based alternative to Cisco, 3Com is betting its future on enterprise switching, VoIP, wireless and security products.

To drive down costs, 3Com has slashed its payroll and shuttered factories. Rather than manufacture products in-house, 3Com has adopted a multi-part strategy that includes outsourcing to companies such as Flextronics and Jabil, reselling products from other vendors (such as security switches from Crossbeam Systems) and embarking on a bold joint venture with a Chinese manufacturer.

3Com invested $160 million last year to establish an engineering and manufacturing joint venture with Huawei Technologies. In the first arrangement of its kind between a U.S. network company and a Chinese partner, the joint venture will develop and manufacture enterprise switches and routers that will be sold in China and Japan under the Huawei-3Com banner and in the rest of the world as 3Com gear.

"We've spent the last year and a half building out a complete portfolio of enterprise products," Claflin says. The CEO knows plenty about portfolio building: In the early 1990s he was the No. 2 man at Digital Equipment.

> “3Com was like a yo-yo, in and out of so many businesses you never really knew what they were about.”
>
> **Lee Doyle**
> Analyst, IDC

The task at hand is to increase revenue, which won't be easy because 3Com's connectivity business is spiraling downward. The network interface card (NIC), PC card and ASIC parts of the business, once the company's cash cow, brought in $51 million in the third quarter of 2003, but only $23 million in the third quarter of 2004. Claflin predicts a 40% decline in the current quarter.

The challenge then is to significantly boost revenue from enterprise products. The enterprise business stood at $149 million in the third quarter of 2004, down from $166 million a year earlier, and the company is predicting only a 5% to 7% increase in the current quarter. The joint venture is still in its early stages and is not contributing significantly to 3Com's bottom line.

Could have been a contender

Instead of being merely a Cisco alternative, 3Com could have been a contender. In the early 1990s, 3Com was actually bigger than Cisco, with sales of $723 million in 1993, compared with $649 million for Cisco. But price erosion began ravaging the adapter card business, 3Com was late to the Ethernet switch party, and the merger with U.S. Robotics was a bust. Cisco saw revenue skyrocket, thanks largely to the Internet boom of the late 1990s and demand for its high-end switches and routers,.

By 1996, Cisco was almost twice the size of 3Com — $4.1 billion vs. $2.3 billion. By 2001, Cisco was more than nine times bigger — $22.3 billion vs. $2.4 billion. And today, Cisco is roughly 20 times bigger — $18.9 billion vs. $932 million.

Despite its changing fortunes, 3Com is not in imminent danger of disappearing, thanks to its $1.4 billion cash horde. But the company continues to hemorrhage money: it hasn't reported a profit since the fiscal year ending June 2, 2000. And the consensus earnings forecast from 12 analysts, published recently by Nasdaq, projects yearly losses through fiscal 2005.

For the quarter ending Feb. 27, 3Com reported sales of $172 million, down 21% from $216.5 million last year. Losses totaled $86 million, up from $79 million the year before. In the second quarter, sequential revenue was up 12%, which seemed to offer some hope that the company had bottomed out, but third-quarter revenue was down 4% compared with the second quarter.

Despite the barrage of bad financial news, Claflin remains positive. He says the wireless, security and IP telephony markets show signs of life, and 3Com has products in all of those areas. He maintains that 3Com's survival has never been in doubt.

3Com through the years

In the highly competitive network industry, very few companies have managed to survive for 25 years. But 3Com, despite some rocky stretches, is still standing.

1979
3Com founded by Ethernet co-inventor Bob Metcalfe.

1981
Ships first product (Ethernet adapter); Bill Krause joins company as president.

1982
Sales reach $1.8 million; Krause becomes CEO, Metcalfe vice president of sales and marketing.

1983
Ships first Ethernet NIC for IBM PC.

1984
3Com goes public. (*No stock data available before June 1989.)

1987
Merges with Bridge Communications, Eric Benhamou joins 3Com as part of merger.

1988
Ships 3+Open LAN manager to disappointing sales.

1990
Krause leaves company. Board names Benhamou CEO; Metcalfe leaves company.

1991
Benha
mana

ry pillar hits 25

"We did one thing really well early on," Claflin says. "We made absolutely sure we protected our balance sheet. While the company had lots of difficulty and had to do all kinds of downsizing and changes, there never was a question as to whether or not our existence was in jeopardy."

Claflin says his strategy for growing the company is to be a lower-cost alternative to Cisco and whether the products are designed and built by 3Com is less important. The joint venture with Huawei lets 3Com ride shotgun over product development while ridding its own payroll of expensive engineering talent and manufacturing plants.

"A year ago 3Com had about 300 engineers on its payroll developing product. Today, we have closer to 900 engineers working on our behalf. Yet the cost of this is all off our books," Claflin says.

According to Gartner analyst Mark Fabbi, Claflin's math is on the money. "A Chinese engineer costs one-sixth of an American engineer. Not only is 3Com getting a good deal, Huawei is garnering an increasingly good reputation in Asia," he says.

Cash cow dried up

Peter George has seen 3Com from both sides. As CEO of Crossbeam, George currently supplies 3Com with enterprise security hardware, and from 1988 to 1993 he was 3Com's Northeast regional director.

He says the company went wrong by dabbling in too many markets ranging from commodity network adapters to enterprise switches to service provider gear. 3Com "ended up having a disjointed long-term strategy," George says. Acquisitions such as the Kerbango Internet radio company were not in line with 3Com's core competencies, and "they ended up losing ground," he says.

"3Com's money machine was network adapter cards while Cisco's was routing and switching. 3Com went out and acquired switching technology, but this never meshed with its bridge and router business," says Lee Doyle, an analyst at IDC.

Going all the way back to 3Com's early days, it was the humble network adapter card that vaulted 3Com to riches. The 8-bit, 10M bit/sec EtherLink bowed in January 1987 and carried a hefty $495 price tag; by year's end, a half-million had been snapped up. Shipments surpassed 2 million in 1991. By 2003, 3Com claimed more than 4 billion installed connections, including adapters and ports. Despite commodity pricing and relentless competition from Intel and others, NICs were 3Com's heart and soul: they accounted for 53% of total revenue in fiscal 1995 and 44% in fiscal 1997. In 1996, 3Com's NIC market share exceeded 42%, compared with 11% for Intel.

> **"If the goals were to survive and thrive, we clearly get good marks for survival. We'll see how we do when it comes to thriving."**
>
> **Bruce Claflin**
> CEO, 3Com

Today, 3Com's Gigabit EtherLink server NIC costs about $50, and the company's connectivity business accounts for only 16% of total revenue.

"NICs were the mother lode," IDC's Doyle says. "They couldn't make them fast enough, but eventually the bottom fell out of the market. Times change."

When Intel slashed its own NIC prices by 40% in a February 1997 bid for market share, 3Com matched the cuts, but the price war signaled the end of the NIC's heyday. Looking for growth, 3Com acquired U.S. Robotics four months later for $7.3 billion.

There were other missteps and false starts. For a time in the late 1980s, 3Com was in the server business. Then there was 3+ Open, the network operating system developed in partnership with Microsoft. A re-branded twin to Microsoft's own OS/2 LAN Manager, 3+ Open was 3Com's bid to compete with Novell and its ubiquitous NetWare 386. But it was not to be. Microsoft ditched LAN MAN, and 3Com pulled the plug on 3+ Open.

"It was ahead of its time," says Alan Kessler, a former 3Com executive. But when it was clear the business was going nowhere, Kessler personally called 3+ Open customers, explaining the decision to quit the business. "It was painful, but it was the right thing to do, and we did it at a time when we were still financially strong," he says.

Gartner's Fabbi sees it differently. "3Com was a hardware company. Why they wanted to be in the [operating system] business I'll never understand," he says.

Over the years, 3Com completed a variety of acquisitions, snapping up technologies such as bridges, token ring, remote access, ISDN, broadband, audio and telephony. But the deal with U.S. Robotics proved to be a particularly bad move, according to many analysts.

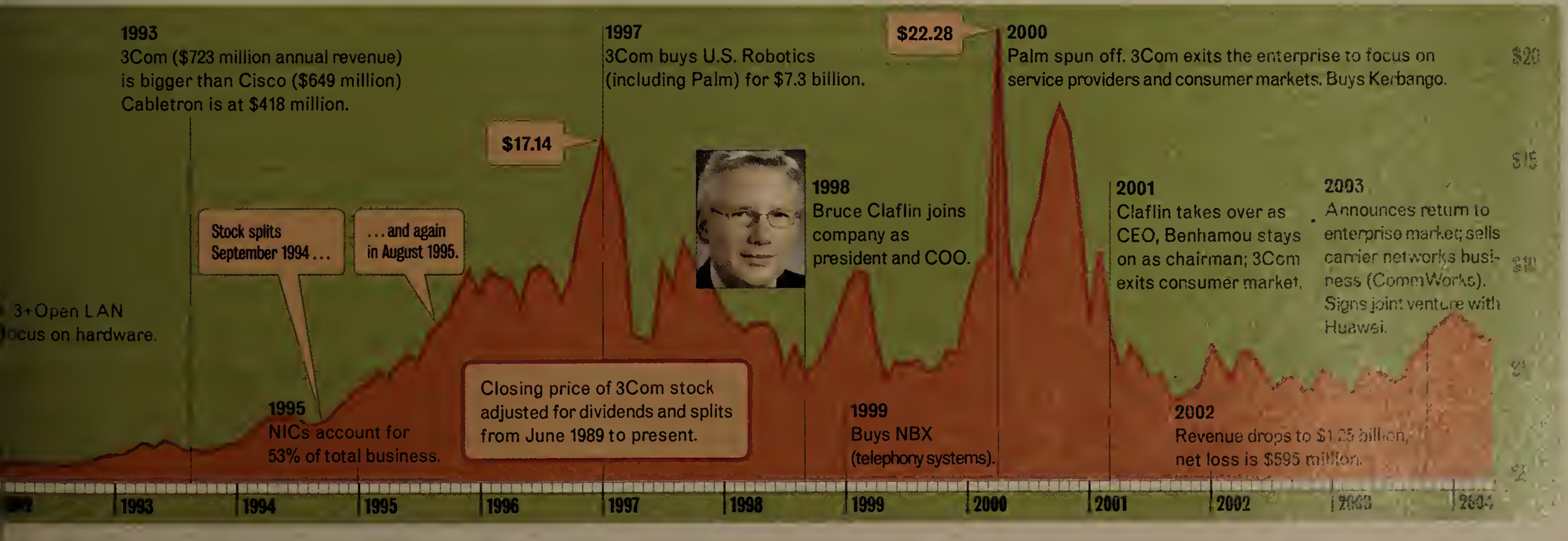
"USR was a complete disaster," Doyle says. "They went out and bought a modem company at a time when modems were being integrated into chips."

Fabbi agrees. "An utter disaster," he says. Modems were already past their peak. "Cable modems were starting to hit, but 3Com never had a plan to take USR forward to newer technologies," he says.

Kessler has a different take on the deal. He says 3Com was never interested in U.S. Robotics' modem business.

"We didn't want the modems; it was USR's concentrator business that 3Com coveted, selling large [communications systems] to ISPs, carriers and telephone companies," he says. However, even though concentrators were a huge market at the time, they diminished in importance as broadband connections gained in popularity. The timing couldn't have been worse.

Of course, the wild card in the whole U.S. Robotics deal was Palm Computing. Palm launched its first product, the Pilot 1000, in March 1996. By December 1997, the PalmPilot had been crowned *Newsweek's* "high-tech



Closing price of 3Com stock adjusted for dividends and splits from June 1989 to present.

gizmo of the year." Kessler found himself in charge of the Palm juggernaut. "Palm was moving so fast, we couldn't get out of the way of its own success," he says. Palm exploded into a multibillion-dollar business, eventually splitting into two divisions, one for hardware, another for the operating system.

Aside from his legendary inability to drive within posted speed limits, one bad rap that dogs former CEO Eric Benhamou is his handling of the Palm spin-off. Most people agree Palm should have been spun off because PDAs were not core to 3Com's business, but some question Benhamou's timing.

When Palm's two founders went to him asking to be spun off, Benhamou declined. After they quit to form rival Handspring, Benhamou reversed his decision.

According to Claflin, that was a smart move. Benhamou rejected the advice of 3Com's investment bankers who said an early 1998 spin-off would bring $2 billion. By waiting until March 2000, shares, priced for the IPO at $38, soared to $95, yielding a preliminary market value of about $54 billion.

"By holding on to Palm for an extra year, Eric created enormous additional shareholder value," Kessler says. "And at the end of the day, that is precisely what a CEO is paid to do." Today, Kessler is CEO of Z-Force, a maker of file switches.

After Palm's IPO, 3Com spun off the U.S. Robotics' modem business to an alliance formed by 3Com, Taiwan's Accton Technology and Singapore's NatSteel Electronics. The new multinational company sports an oddly familiar name: U.S. Robotics. On the same day, 3Com abandoned the enterprise business, killing off its CoreBuilder, PathBuilder and NetBuilder product lines.

In August 2000, 3Com jumped back into the acquisition fray with the $80 million purchase of Kerbango, a start-up developing an Internet radio appliance. It also was pouring serious development money into Audrey, in what was deemed the countertop Internet appliance of the future.

"Here's an enterprise networking company, and they acquire a radio? It didn't make any sense then, and it doesn't now," IDC's Doyle says.

Nevertheless, this product duo, launched with great fanfare at the Consumer Electronics Show in 2001, was 3Com's latest darling, the centerpiece of its "digital home" initiative.

But not for long. Three months later, both were history, shut down by Claflin in an apparent total loss. "It was very clear to me that the [Internet] bubble had burst," Claflin says. "I made the decision to exit markets where there was little likelihood of a profitable business in a reasonable period of time." That included the consumer market.

Metcalfe, who left the company in 1990, was a huge fan of Kerbango, extolling its virtues in a weekly column he wrote for *InfoWorld* and on his televised "From the Ether" Webcast show. Looking back, Metcalfe now says he did not know why 3Com bought and closed Kerbango. "Many foolish things were done by many people during that time," he says. Whether he was referring to Benhamou's acquisition or Claflin's subsequent shutdown is unclear, and Metcalfe would not discuss other aspects of the company.

IDC's Doyle was less generous. "3Com was like a yo-yo, in and out of so many businesses you never really knew what they were about. Audrey had as much to do with enterprise networking as did paying to put 3Com's name on Candlestick Park," he says.

In March 2003 the remaining piece of U.S. Robotics was shown the door when 3Com sold off its CommWorks unit, its one-time telco hardware business.

Back to the future

The decision to exit the enterprise market still haunts 3Com. "The move out of the enterprise market is the most damaging thing 3Com has ever done. Now it's four years later, and it still leaves a very negative taste in everybody's mouth," Gartner's Fabbi says.

But Claflin says the company had no choice at the time. 3Com had neither the right network products nor the resources to develop new products. The decision was made to get out.

Even though 3Com continues to lose money, Claflin's radical surgery is garnering some support among investors. The company's stock is selling at about $7 a share, well above its 52-week low of $3.91.

"If the goals were to survive and thrive, we clearly get good marks on survival," Claflin says. "We'll see how we do when it comes to thriving."

"3Com still has brand cachet that will allow doors to reopen," Crossbeam's George says. "But when they walk through those doors they better have world-class products and a great story."

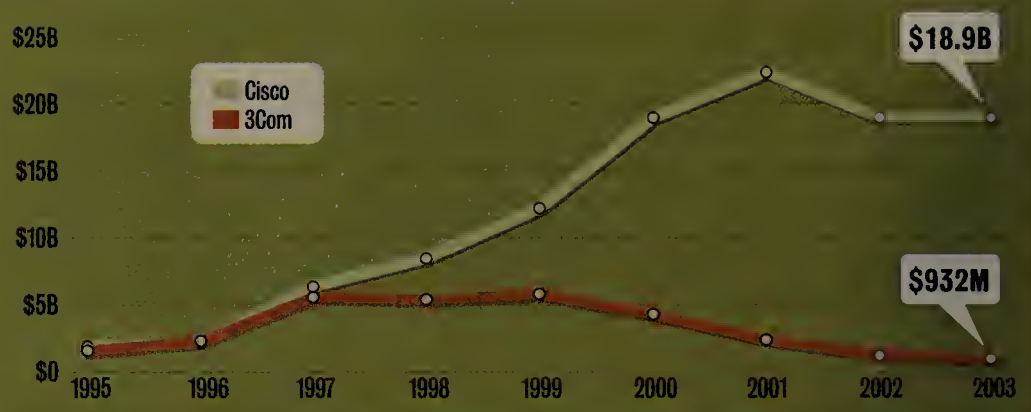
3Com has launched a bunch of new products recently, including an enterprise-class IP-based desktop phone, an enterprise switch developed as part of the joint venture, a security switch and a Layer 3 workgroup switch.

"What will make or break 3Com is whether they can change their negative perception," Fabbi says. They can build a great channel and support organization and have great products, but whether anyone will listen is the other side of the story."

Shore is a technology journalist in Southborough, Mass., who provides product-strategy consultation and editorial-development services to technology companies at www.joelshore.com.

3 Com-petition

In 1995 3Com and competitor Cisco each had revenues in the neighborhood of $2 billion. Cisco has since moved out of that neighborhood.



Here's how 3Com stacks up against the competition overall:

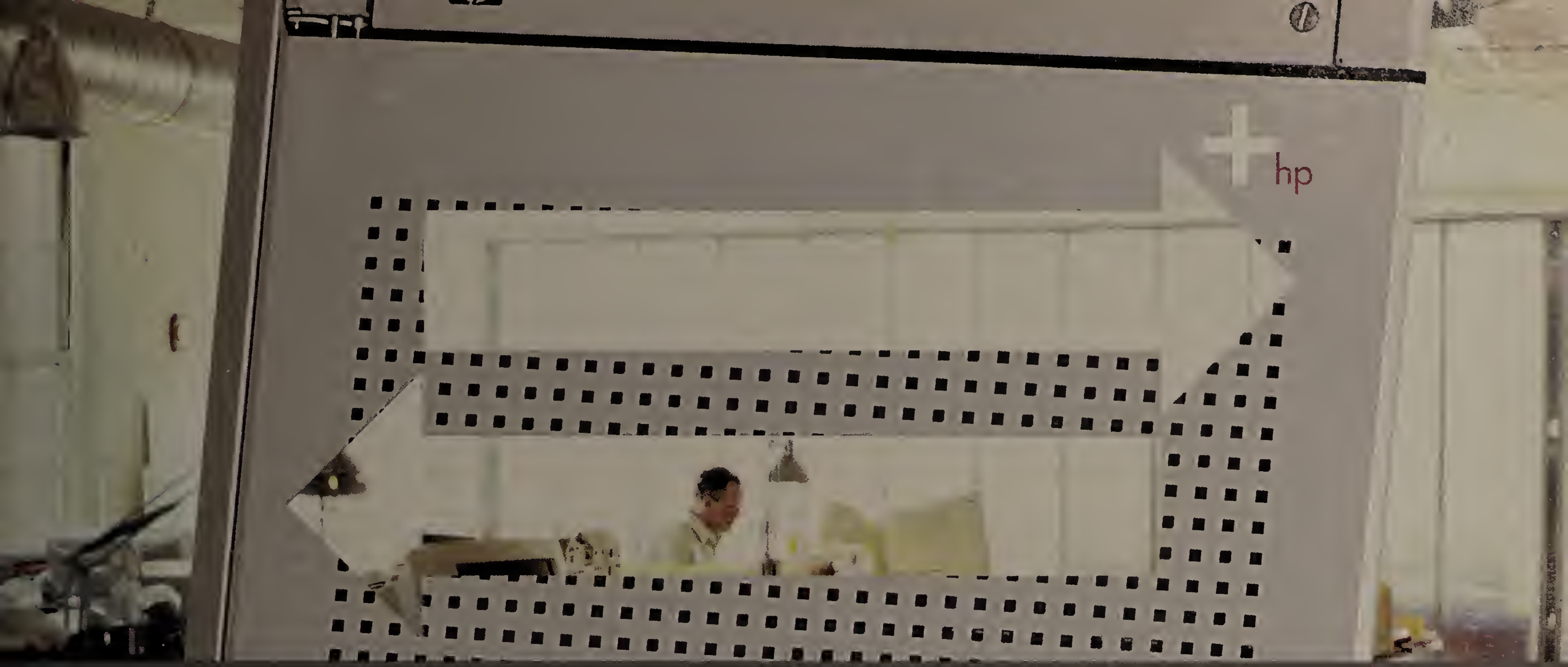
Critertia (Trailing 12 months as of 3/9/04)	3Com	Cisco	Enterasys	Nortel
Market capitalization	2.6B	152.37B	715.11M	29.5B
Employees	2,100	34,000	1,500	36,960
Revenue	763.70M	19.82B	414.54M	9.81B
EBITDA	-407.06M	5.71B	-83.18M	501M
Net income	-420.56M	4.35B	-114.84M	387M

25 years, 25 acquisitions

3Com has acquired a variety of companies in its history.

Company acquired	Date	Technology	Value ($ millions)
Bridge Communications	Sept. 1987	High-performance LAN systems	$240.8
Communication Solutions	July 1988	SNA peer-to-peer connectivity	$16
BICC Data Networks	Jan. 1992	Hubs	$25
Star-Tek	Jan. 1993	Token ring technology	$56
Synernetics	Dec. 1993	Data center switching	$104
Centrum Communications	Feb. 1994	Remote-access servers	$36
NiceCom	Oct. 1994	ATM innovator	$58.5
AccessWorks	Feb. 1995	ISDN innovator	Not disclosed
Sonix Communications	May 1995	U.K. ISDN internetworking	$70
Primary Access	June 1995	Remote-access systems	$170
Chipcom	Oct. 1995	High-end chassis hubs and switching	$775
Axon Networks	March 1996	Remote network management software	$65
OnStream Networks	Nov. 1996	ATM/broadband WAN access products	$245
US Robotics	June 1997	Modems, Internet access systems, PDAs	$7,300
LANWorks Technologies	March 1998	PC network boot technologies	$13
EuPhonics	Dec. 1998	DSP-based audio software	$8.3
ICS Networking	Feb. 1999	Customer-owned tooling technology	$16
SmartCode Technologies	Feb. 1999	Wireless data communications, Internet access software	$17.5
NBX	March 1999	Network-based telephony systems	$90
IWC	Dec. 1999	E-Business consulting and software engineering	Not disclosed
LANSource	Dec. 1999	Data-and-fax-over-IP software applications	$26
Call Technologies	March 2000	Unified messaging	$90
Kerbango	Aug. 2000	Internet audio solutions	$80
Nomadic Technologies	Oct. 2000	Wireless network products	$33
Alteon WebSystems	Nov. 2000	Gigabit Ethernet solutions	$110
		Total	$9,645.1 *

* [illegible] PAID FOR ACCESSWORKS AND IWC



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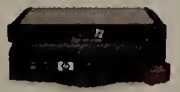

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3Com CEO Claflin focuses on revenue growth

Bruce Claflin, a former network executive at IBM and Digital Equipment, joined 3Com as president and COO in 1998. At the time, 3Com was riding high after its huge merger with U.S. Robotics. But the Internet bubble burst in 1999, the merger didn't pan out and 3Com's fortunes went downhill fast. By 2001, Eric Benhamou was out as CEO and Claflin was at the helm. He moved quickly to get 3Com out of ill-conceived ventures such as Internet radio. As revenue continued to plummet and losses mounted, Claflin switched the company's target market from service providers back to the enterprise, abandoned manufacturing altogether, and entered into a bold joint venture with a Chinese network gear manufacturer. Joel Shore recently caught up with Claflin.

These last three years haven't been easy.

I really believe that what we've been through is really the ultimate test of whether you can lead a company — can you lead it in good times and in bad. And in that regard it's been quite a challenge. It's exciting. And because we think we're coming out of it, it's also exhilarating. If the ship had gone down, maybe I wouldn't feel quite so positively.

A lot of people think it almost did.

I don't think it almost went down because we did one thing really well early on, and that is we made absolutely sure we protected our balance sheet. We kept lots of cash, high liquidity, did everything we could to ensure that we'd never have to face any underlying financial problem.

In September 2003, 3Com announced that is was closing all of its manufacturing facilities and embarking on the joint venture with Huawei Technologies, a Chinese company. How is that going?

So far so good. You'll recall we had already outsourced quite a bit of our manufacturing a few years ago so this was an extension of something we were already doing. And in that regard it's not as new or revolutionary.

The Huawei joint venture is a different deal. That was brand new; we were creating the company from scratch, it's the first major company that's a joint venture between an American and a Chinese high-tech company that has, as its principal mission, [research and development]. Most ventures up to now have been just sales and marketing into China or maybe in manufacturing. This is the first time we actually put R&D inside a China-based joint venture and it was very new for China and new for our industry. So far we're very encouraged. But it's early; we just began in November.

What's the customer reaction? 3Com has been in the enterprise businesses, out of it, and back in again. Customers don't know what to make of it.

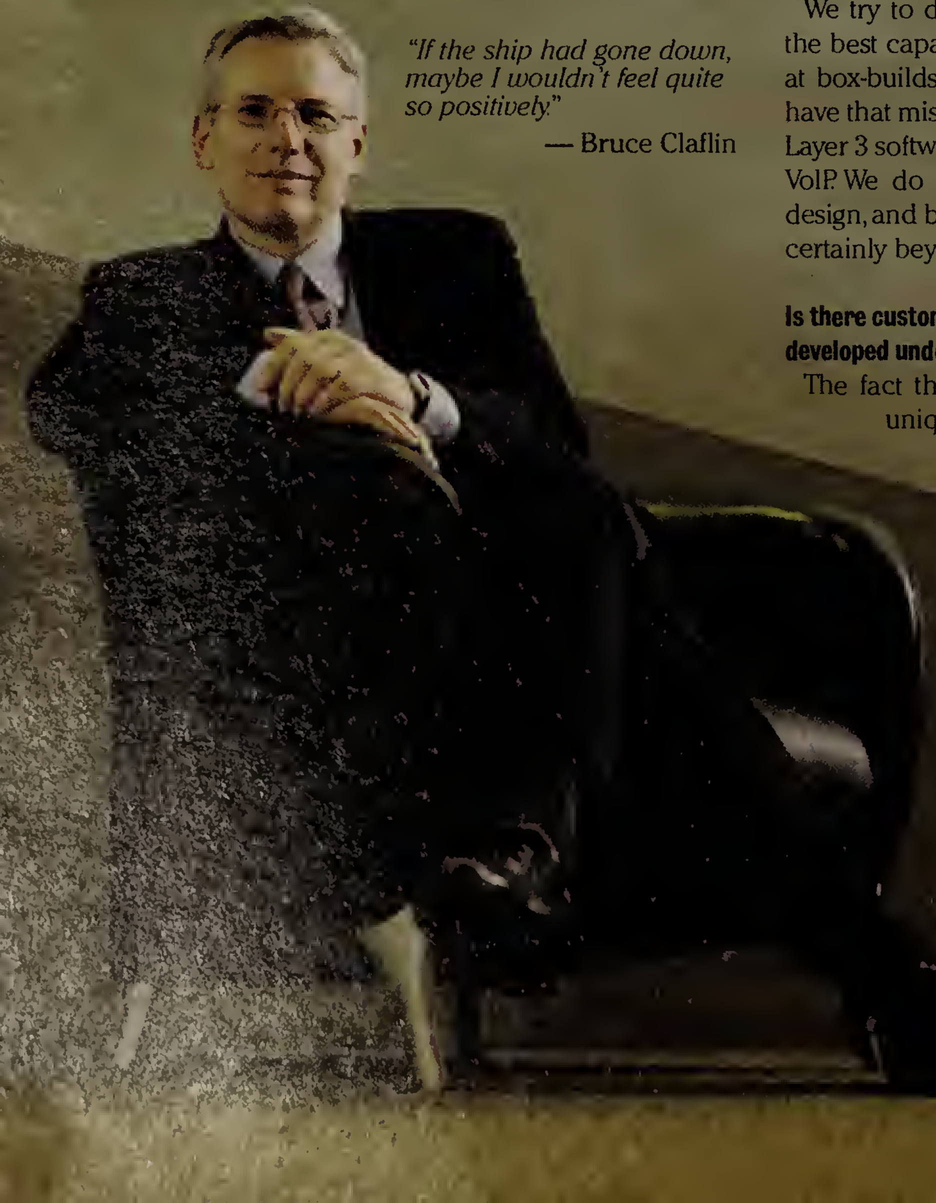
I think you're, to a large degree, right, but not completely right. We do have a large installed base in the enterprise and it's a satisfied installed base. We have a strong brand. So while there's been lots of changes in the company, there are some things that have endured. A good quality installed base, a good customer base, a strong brand, which we've been able to leverage as we go forward.

Will 3Com keep R&D for growth areas such as VoIP and security in-house?

We try to do our development and sourcing wherever the best capabilities exist. The joint venture is really good at box-builds, Layer 3 and the operating system. So they have that mission for us, all of our high-end switching and Layer 3 software. We're good at network management and VoIP. We do the engineering in-house, they do the box design, and between the two we have an extended reach, certainly beyond what we could have done on our own.

Is there customer reluctance to buy these products that weren't developed under 3Com's roof?

The fact that we are sourcing products in Asia is not unique. What is unique is that we're sourcing it inside a venture that we have a substantial ownership in, and that we're doing it in a collaborative way where we share intellectual property.



"If the ship had gone down, maybe I wouldn't feel quite so positively."
— Bruce Claflin

How is 3Com restoring the faith that enterprise customers have lost?

Restoring implies that it doesn't exist. There is a large installed base of very happy customers who buy from us. But let's agree that while we have an installed base it's a small one relative to the total market size. How do we penetrate the customer who does not have us today? There are several things:

The first is, you have to really be able to demonstrate that you have a range of products and solutions — and not just that they're cost-competitive to buy — but that their cost of ownership is competitive. You have to show they have all the right features and attributes. And you have to have confidence that you'll meet customers' needs now and in the future. We typically will show them our road map. And then lastly, we show them our commitment to service and support. And if you do all of that, I'd argue that then convinces them you're a credible supplier.

In late 2000, 3Com acquired Kerbango, basically an Internet radio, for $80 million. And the company introduced Audrey, the home Internet appliance. A few months later both products were killed. It looked like 3Com was out of control.

It was very clear to me that the bubble had burst, that many markets we felt were going to grow rapidly weren't going to grow rapidly. And included in that was the nascent consumer market. As a part of the response to that downturn in the bubble, I made the decision to exit markets where there was little likelihood of a profitable business in a reasonable period of time.

There was a lot of talk that when 3Com acquired U.S. Robotics it didn't know what Palm was, that it was just some little thing that no one really understood.

Well I think that's true. I wasn't here at the time, but I think everyone who was said of all the things they hoped to get out of U.S. Robotics, Palm was probably lowest on the list.

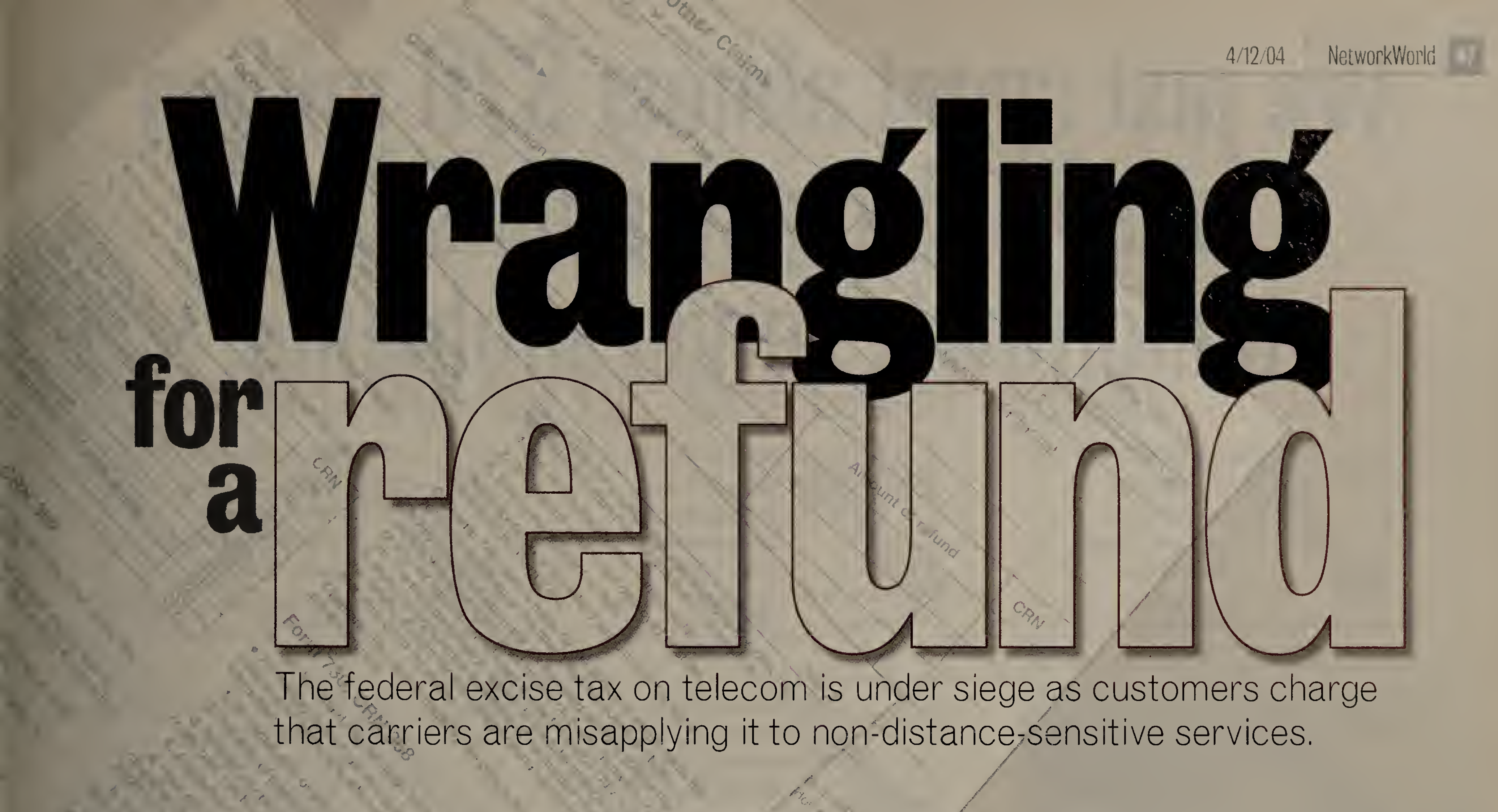
How do you grade your efforts since becoming CEO in 2001?

I give our senior management team exceptionally good marks in recognizing that there was a fundamental change in the marketplace, that demand was going to drop and that it wasn't just some short-term thing. We took a set of actions very early on in the meltdown that ensured that we would not only survive the downturn, but survive it with a really strong underlying financial position.

But earnings per share is still negative.

To turn that around, we have to grow. If the accent was on cost-cutting two years ago and growth was secondary, it is reversed today. We'll continue to take cost and expense out, but we absolutely are driving the growth strategy this coming year. ■

Go online for the complete interview: www.nwfusion.com, DocFinder: 1321.



Wrangling for a refund

The federal excise tax on telecom is under siege as customers charge that carriers are misapplying it to non-distance-sensitive services.

BY DAVID ROHDE AND STEPHEN ROSEN

It's been about a decade since long-distance carriers began flat-rating their per-minute toll charges instead of charging according to mileage bands. But only recently have many network managers begun to realize that this move should have changed the way the carriers apply taxes.

Several dozen Fortune 500 corporations have filed requests with the Internal Revenue Service for refunds of the 3% federal excise tax on toll telephone service. Their argument: Under the law, the tax applies only to calls whose prices vary by time and distance. And hardly any interstate calls vary by distance now — a call from Chicago to Cincinnati costs the same as a call from Chicago to San Diego.

While the IRS officially disagrees with this argument and has often dithered with these requests, a federal court in Cleveland has ruled in favor of these types of refunds and might force the IRS' hand. In February the court issued a ruling that, if upheld on appeal, will force the government to refund more than $380,000 to OfficeMax because of excise taxes improperly collected since 1999 on the retailer's MCI long-distance bills.

The court ruling might spur similar refund requests from a range of corporate customers, especially because the stakes are huge. In 2002, the most recent reporting year, the U.S. government collected up to an estimated $2.51 billion from the federal excise tax on toll telephone service. By making claims that go back three years — the statute of limitations for this type of tax refund — companies in one fell swoop could recover up to 9% of their current-year spending on such long-distance tolls.

In a 1965 law that reformed the system of excise tax collection, Congress defined "toll telephone service" to mean "a telephonic quality communication for which there is a toll charge which varies in amount with the distance and elapsed transmission time of each individual communication." Without distance sensitivity, the tax no longer appears to apply.

Arguably, the federal excise tax was flawed from the beginning. In general, excise taxes are levies the government placed on non-essential goods. The telephone excise tax began in 1898 as a measure to help pay for the Spanish-American War. But telephone calls were a novelty then, so the charge was in effect a "luxury tax."

With the 1965 Excise Tax Reduction Act, Congress tried to eliminate the tax on numerous goods and services. Congress reduced the telephone tax from as high as 10% to 3%, but a further scheduled phase-out to zero was repeatedly postponed in budget negotiations, and the 3% rate was made permanent in 1990.

Different interpretations

So how do you get a refund for the 3% tax that has stayed in effect ever since then? Prepare for possible frustration along the way, because there are complications:

- The biggest problem is that the IRS officially denies that refunds are due. In a 1979 internal ruling on which it still relies, the IRS said it doesn't believe a call actually must be mileage-rated to qualify as a transaction whose prices "vary in amount with the distance and elapsed transmission time" of the call. The agency says that the legislative history of the 1965 bill indicates that Congress meant to cover the type of flat-rated phone calls placed today, and there are judges who agree on this point. Nevertheless, the IRS did settle some of the early refund claims that arose from users after carriers went to non-mileage-sensitive tolls for 30 to 40 cents on the dollar, but isn't doing so now that the issue is going to court.

While OfficeMax prevailed in Cleveland, the federal court in Miami in January ruled against the American Bankers Insurance Group for a similar $288,000 refund claim on calls placed with AT&T. The difference between the two rulings is whether the word "and" in the phrase "vary in amount with the distance and elapsed transmission time" means "and," as the court in Cleveland said it did, or means "or" as the court in Miami found.

Other courts might find other reasons to rule against refunds. The government has argued that there is an implicit distance sensitivity built into the fact that intrastate calls tend to cost a different amount (often more) than interstate calls. Refund advocates say this is a vestige of telecom regulation, where different authorities govern intrastate vs. interstate calls, and if there were a rational relationship between distance and charges, the shorter-mileage (intrastate) call would always cost less.

- You can't go back to the mid-1990s to make your refund claim. The most common claim is for three years' worth of excise tax to match the statute of limitations. Accurate bill-keeping is at a premium to document a claim, and the IRS asks for the earliest and latest dates of the "event" in question.
- Data traffic is generally not charged excise tax, but wireless traffic is. Just because wireless calls aren't distance-related doesn't mean you can claim a tax refund. Another section of the 1965 law covered taxes on bucket-of-minutes billing plans. At the time this referred to so-called WATS lines — progressive fees for calling specific concentric circles of mileage ranges from your origination point — but today describe the typical wireless plan.

Residential customers theoretically could apply for wireline toll telephone refunds, but there's a Catch-22. Realistically, the only affordable way to do so would be via a class-action lawsuit, and class actions are barred for tax refund matters.

Fight for your rights

Corporate customers do have a number of advantages over the IRS in this fight. While future court rulings can't be predicted, tax-law principles generally hold that the "plain meaning" of statutes shouldn't be bent if they favor the taxpayer, as the Cleveland court noted.

Moreover, the whole point of the 1965 law was to eventually cut out the tax entirely, so arguments based on its "legislative history" are inherently unstable. More court rulings are likely to influence the rate at which the IRS acts on refund requests before they go to litigation.

The best approach, while each federal court jurisdiction takes its turn at the issue, might be to get in line at the IRS with your own refund request. Go to www.nwfusion.com, DocFinder: 1521, for the IRS's refund request form.

Rohde is a senior analyst at TechCaliber, a telecom contract firm. Rosen is a partner in the Washington D.C. telecom law firm of Levine, Blaszak, Block & Boothby. They can be reached at drohde@techcaliber.com and srosen@[illegible] com, respectively.

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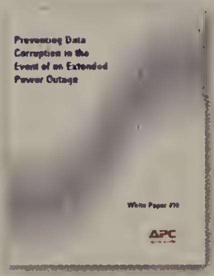

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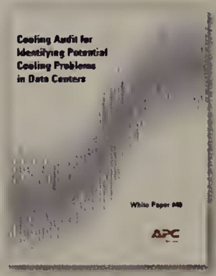

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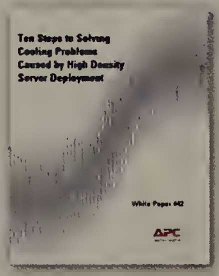

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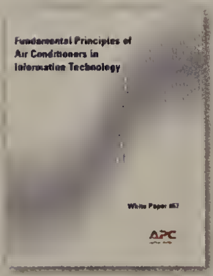

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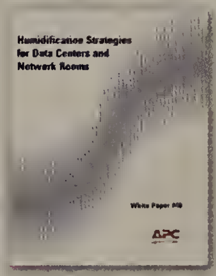

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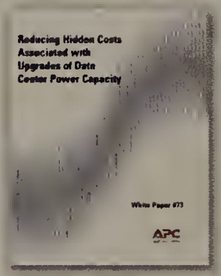

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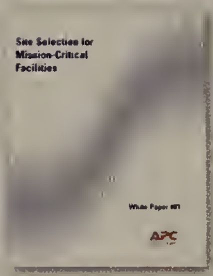

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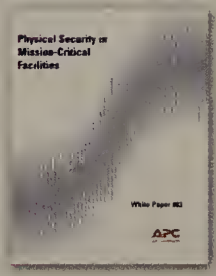

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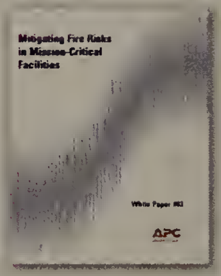

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Gearing up for the CISSP exam

A Certified Information Systems Security Practitioner shares study tips for obtaining the hot certification.

BY BARTON MCKINLEY

I am now a Certified Information Systems Security Practitioner, although it took me awhile to become one. I thought about, debated, delayed and put off taking the exam for almost two years. Even when I finally did sign up for the test, I wondered if I had made a mistake.

Finding the time to study for the International Information Systems Security Certification Consortium's (ISC^2) top-level certification was a challenge, but I considered the certification valuable as a way to distinguish myself with prospective clients. A CISSP is internationally recognized as someone who has senior-level IT security expertise.

When I hit the books, I jumped from topic to topic without much of a plan. This haphazard approach was perfect in generating anxiety, but was virtually useless in preparing for the exam.

Then about eight months ago, I became sick and had to postpone both work and studies. Ironically, this was a blessing. During the downtime I laid out a detailed CISSP study plan and found study materials. I studied in earnest and passed the exam in December.

Based on that experience, I'd like to share some pointers with those who are beginning CISSP certification or thinking about taking the plunge.

Before you decide to take the CISSP exam, go to the ISC^2 Web site (www.isc2.org) to review the certification requirements. You don't want to prepare and then find out that you don't meet the criteria.

The CISSP Common Body of Knowledge (CBK) includes 10 domains, covering about 120 sub-topics.

Rate your level of knowledge of each domain. Examine them carefully because your idea of what fits into a domain might differ from the ISC^2's. I thought I knew all about security management, but much of what I thought was in that domain actually is covered as part of disaster recovery. I had to cram to catch up.

Sort the domains by your knowledge level and assign estimated study times for each, factoring in scope and complexity. For example, the telecom and network security domain is more detailed and encompasses more topics than the physical security domain.

How much study time needed is a personal decision based on your expertise, confidence and ability to learn. Several CISSP preparatory courses and books suggest that you can cram and pass in as little as a week. It's probably more realistic to allow at least 150 hours, spread over three to four months. Add on a few days of studying time as a contingency.

Some people find it helps to join a study partner or group, either of which can be found through the Web. Stick to regular, focused study times, while allowing for more detailed research as needed.

Learn (and understand) the principles and terminologies addressed in each domain first rather than trying to learn all the details upfront. Then expand your knowledge of specific subjects or review domains as needed. For example, be sure you comprehend encryption concepts before you worry about Data Encryption Standard modes.

Choosing study materials

Now you need to select some study resources such as books, Web sites or courses. Many CISSP candidates prefer to take a course, and there are many to choose from, including topic- and domain-specific classes, official ISC2 CBK review seminars and exam preparation seminars.

I read study guides, related books and stories followed by practice tests online. As you accumulate materials, organize them by domain so that you can find the right resource when you need it.

Consider downloading one of the various free study guides to use as a framework for note-taking. Collect acronyms, term definitions, formulae and standards references. For example, you'll need to know the definition of the Bell LaPadula model, when a Class C fire extinguisher is needed and what the common criteria are. These notes will prove useful during your final pre-exam review.

The ISC^2 uses several exams, so practice exams or rumors about the content or difficulty of the exam might not be accurate. My practice exam was barely similar to the exam I took, but was still helpful.

When you're ready, register with ISC^2 to take the written exam. The exam will cost $499 if you register early, or $599 two weeks before the exam date. A $100 rescheduling fee applies if you postpone the exam. Register well in advance, though, as classes fill up quickly. Exams are taken at an ISC^2 facility or another approved location.

As exam day approaches, allow yourself time for review and at least a day of rest. It's critical to get a good night sleep the night before the exam. I made the mistake of taking the exam with only four hours of sleep. I passed, but by half-way through I was miserable. Other test-takers confessed that they had been up all night cramming and expected to fail.

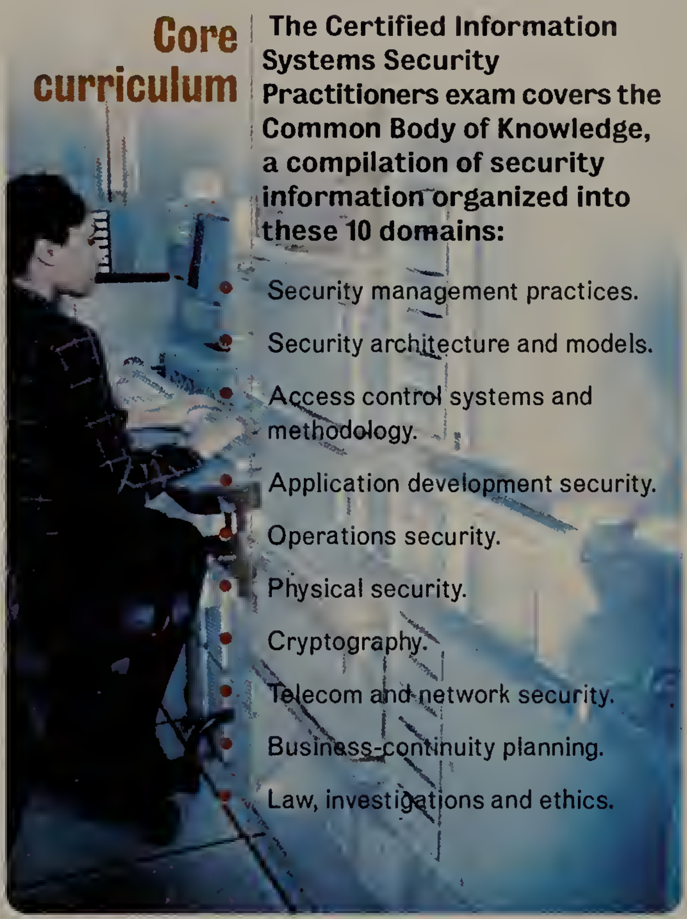
You might need the entire allotted time of six hours for the grueling exam, which consists of 250 multiple-choice questions. The registration process is supposed to take 30 minutes but took me more than an hour.

An ISC^2 designate and volunteer proctors administer the exam. You can't bring reference materials or electronic devices with you, except for a paper dictionary for language translation. You are allowed to bring lunch and any necessary medication, and you can take a quick break to eat, stretch or be escorted to the restroom.

You will need to get a scaled score of 700 points to pass the exam. The rumor is that this works out to a grade of about 80%, although the ISC^2 uses a confidential method for scoring and doesn't publish or provide a grade.

You should get your exam results in four to six weeks. Unfortunately, because of the no-grade policy, you will only learn if you passed or failed. If you pass, you'll receive an endorsement form from the ISC^2 that must be signed by an existing CISSP. After the ISC^2 receives the completed form, the organization will mail your official CISSP certificate and lapel pin in the mail, and the celebrations can begin.

McKinley is a CISSP and president of Summit Communications, a consulting and training firm specializing in network and security architectures and strategies. He can be reached at strategist@summit-com.com.



Core curriculum

The Certified Information Systems Security Practitioners exam covers the Common Body of Knowledge, a compilation of security information organized into these 10 domains:

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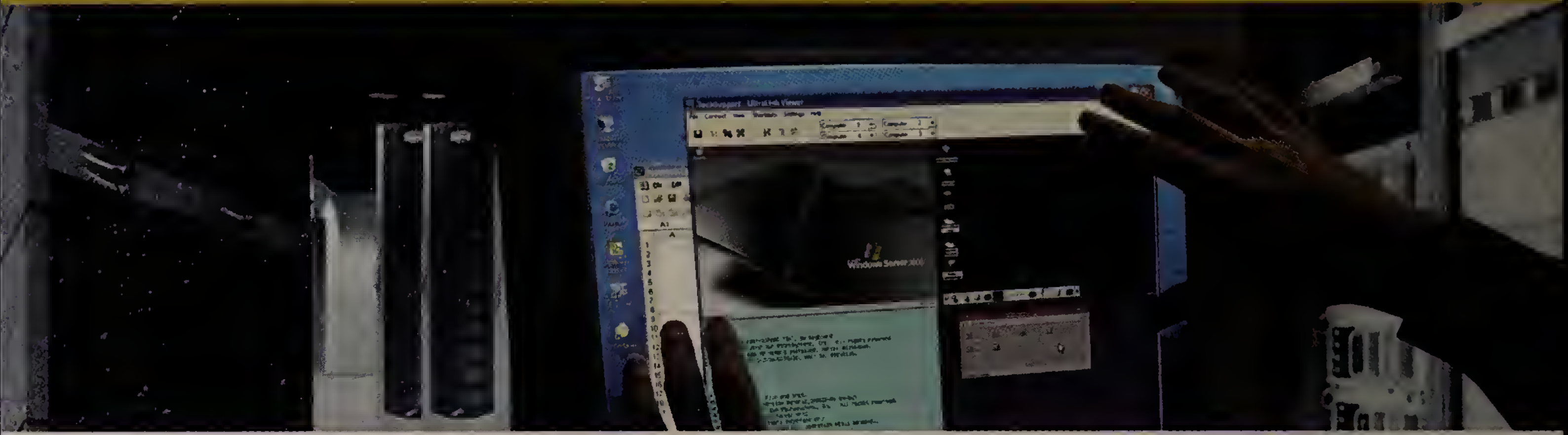

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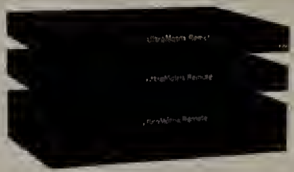

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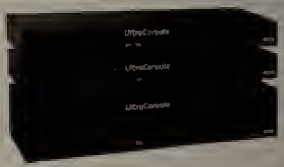

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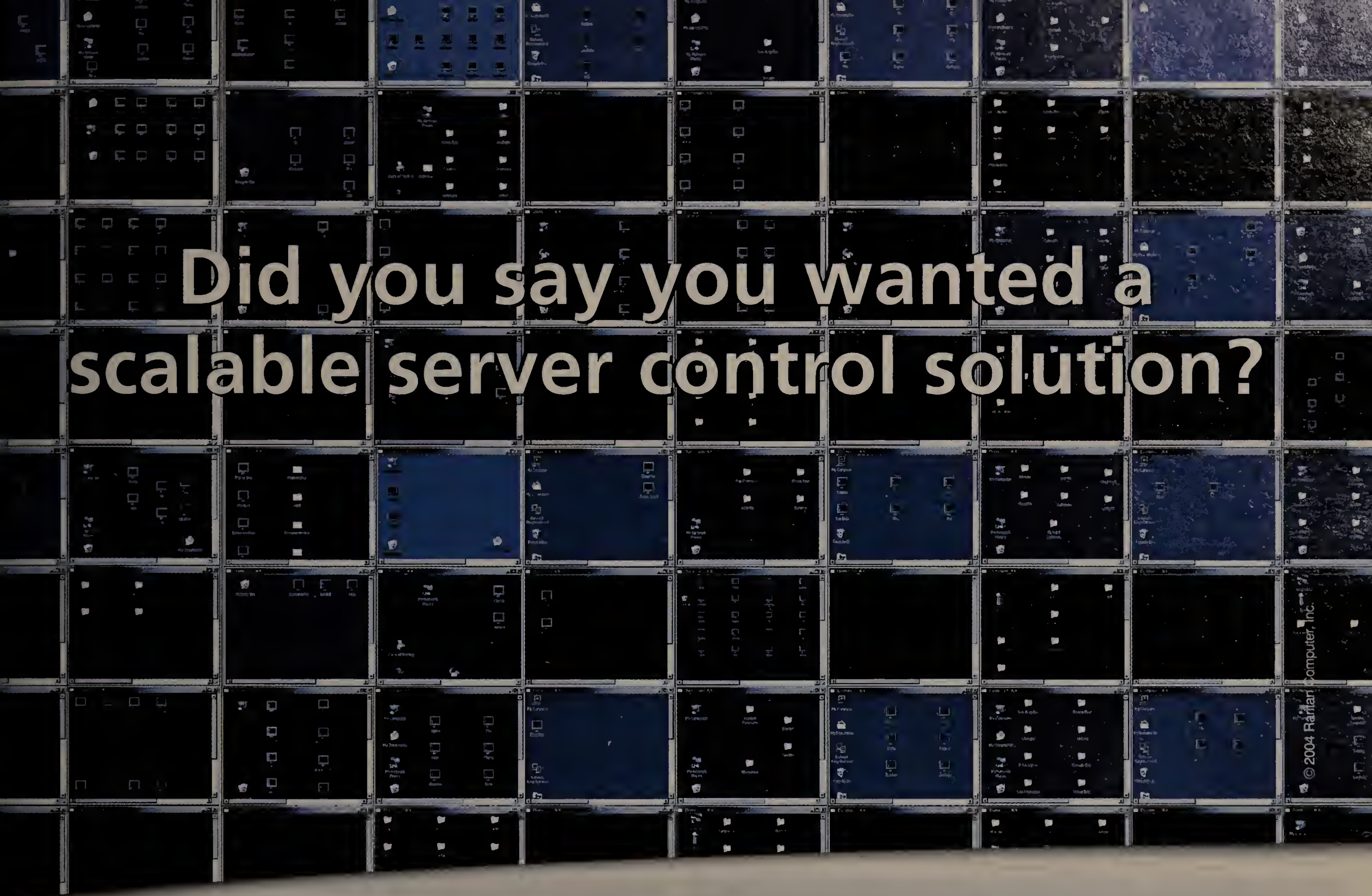

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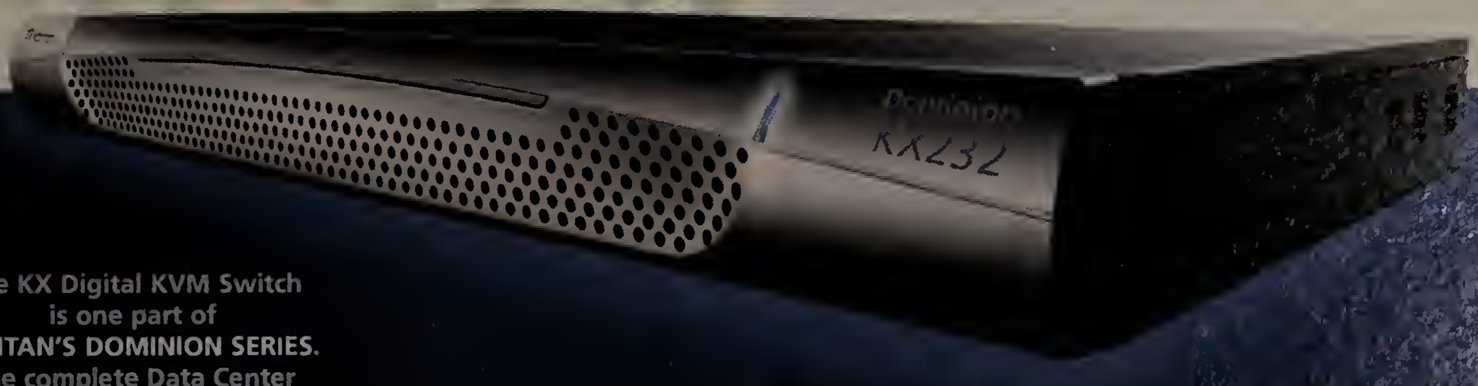

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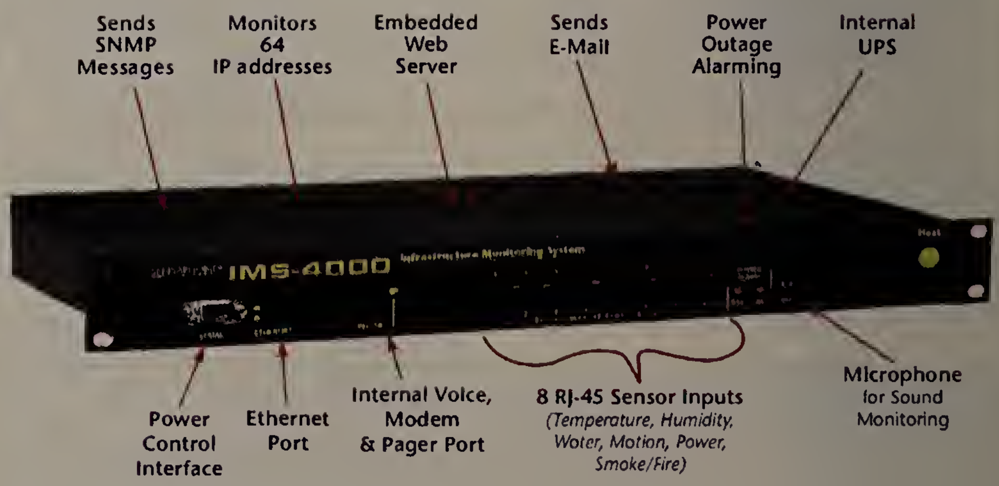
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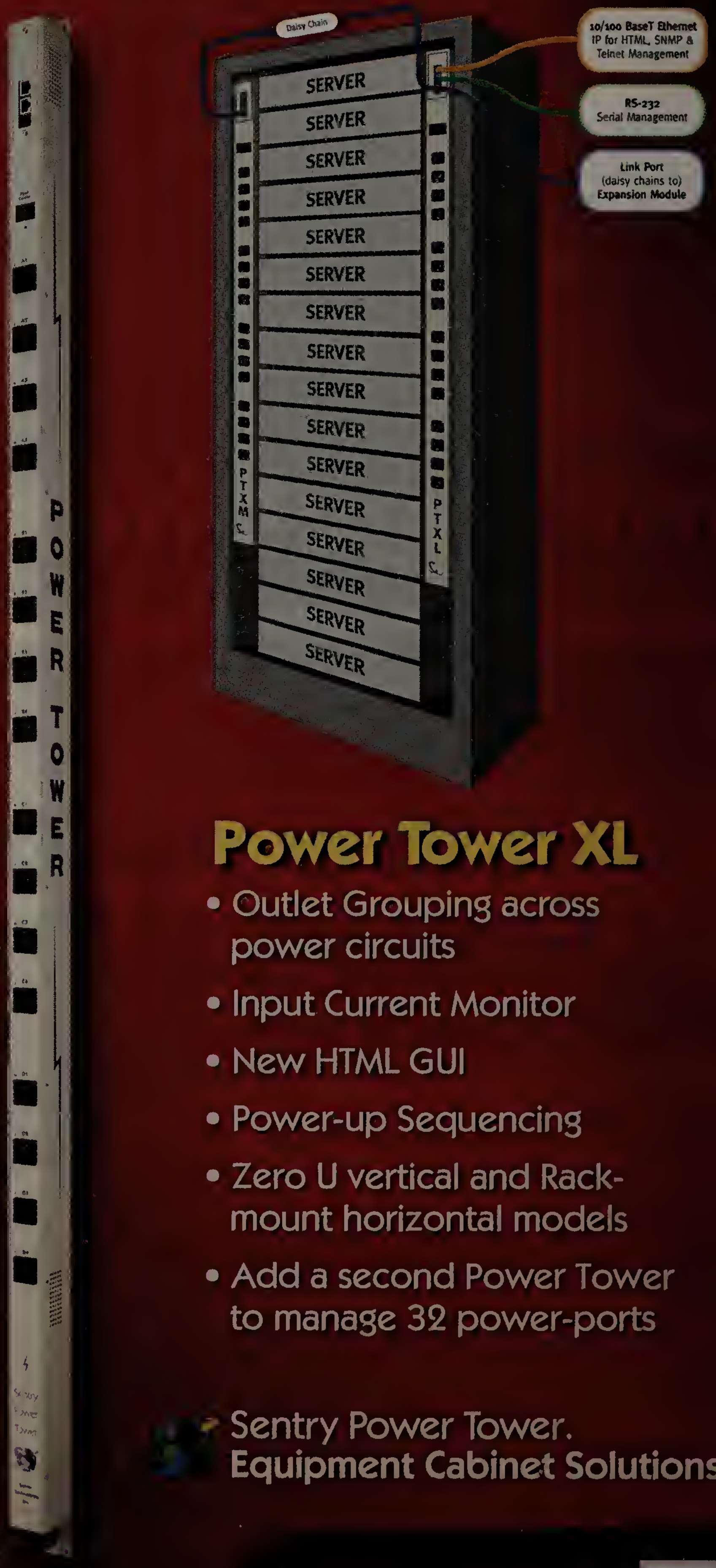

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Computers

Principle Web Applications Developer

Research Triangle Park, NC. Design, develop, test, implement, document and maintain system enhancements and new web applications. Customize, setup and maintain secure web applications with Netegrity SiteMinder in a secure Extranet infrastructure. Setup and maintain identity management software with Netegrity IdentityMinder in a secure Extranet infrastructure. Customize the Plumtree portal framework. Design custom Web Services for global applications. Develop technical specifications of framework modifications and Web Services. Provide time and cost estimates for technical aspects of projects. Perform troubleshooting for the implementation of large scale portal initiatives. Understand the technical and business issues of the customer base and translate into service requirements and processes. Minimize changes to base product and track all changes for easy replication. Evaluation of new web technology software products.

Req.: Bachelor's degree or foreign equivalent in Computer Science or IT field (in lieu of degree, will accept equivalent through education and progressively responsible experience). 1 year of experience in job offered or as Web Applications Developer. 1 year experience in the following, which may have been obtained concurrently: eBusiness technical consulting; and Plumtree Portal Software, relational databases, Oracle, LDAP, XML, ASP, PVCS and DHTML.

GSK is dedicated to an innovative workplace and supports you with career-long opportunities & learning. We offer a competitive benefits and compensation package. For confidential consideration please forward 2 copies of resume to: BHG Box 33410, 220 E. 42nd St., 14th Fl., NY, NY 10017. Indicating ad code "WAD" is essential. Principals only, no agencies. GSK is proud to promote an open culture, encouraging people to be themselves and giving their ideas a chance to flourish. GSK is an equal opportunity employer.

IT PROFESSIONALS:

Financial Systems Analyst

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Design, develop, maintain SQL Server to build financial web applications. Develop relational database design utilizing Microsoft Visio. Develop and maintain database backup/recovery plan and restore operations. Utilize SQL programming, Crystal Reports and other related technologies in MS Access environment to develop reports. Develop ActiveX Server Page (ASP) utilizing Visual Basic Script and HTML. Write ASP scripts to integrate SQL Server database information into HTML. Utilize Visual Basic Scripts to write forms to connect databases and passing variable values to stored procedures. Utilize Home Site and MicroSoft Front Page to develop, maintain and debug ASP. Perform data reconciliation. Utilize data to develop web-based financial reports. Assist with budgeting of costs related to local office expenditures. Support development of regional budget model. Analysis of local/regional budget to ensure actual expenditures are running within budget and perform financial data trend analysis. Perform financial operation analysis. Present results to regional firm leader.

The wage offered is $57,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree in Business Administration, Accounting, Computer Science, Information Systems, Economics or Math + 2 years of experience in the job offered or 2 years of experience as a Financial Data Manager, Project Accountant, Contract, Associate, Financial Staff/Computer Staff, Financial Analyst or Analyst. At least one year of related experience must include SQL Server, MS Access, MicroSoft Visio, SQL programming, Visual Basic Script, HTML, Home Site, Microsoft Front Pages, Crystal Reports and ActiveX Server Pages.

Please send your resume, referencing Job Order Number **WEB-405466** to the: PA CareerLink, FLC Unit, 235 West Chelten Avenue, Philadelphia, PA 19144. EOE.

IT PROFESSIONALS:

Senior Consultant

POSITION: (Glen Mills, PA and other locations throughout the United States). Responsible for gathering and documenting technical systems and requirements through user discussions and writing functional and technical design documents. Implement design and development of data interfaces using PL/SQL and Oracle 9i as the RDBMS (Relational Database Management System) in conjunction with Quest tools. Design custom Oracle interfaces and scheduling for the interfaces in UNIX environment. Responsible for the version control and migration of batch scheduling scripts across environments. Design, develop and implement data interfaces to extract information from legacy mainframe-based systems and load them in the desired format to Oracle databases. Design database and tables using Erwin data modeling tools to save the data currently stored in legacy databases for easy extraction for a Web-based ordering and forecasting tool. Work with mainframe developers to recommend, review and suggest revisions to data-extracts in a format suitable for processing and subsequent loading to Oracle databases.

The wage offered is $84,360/year. The work schedule is Monday-Friday 9:00am-5:00pm. The minimum requirements are as follows: Bachelor's degree or equivalent* in Comp Science, Engineering (any), Mathematics, Business Administration or Information Technology + 2 years experience in the job offered or 2 years experience as Senior Consultant, Consultant, Software Engineer, Technical Lead, or Team Lead. Related experience must also include UNIX, Oracle, and Relational Database Management Systems (RDBMS). *Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determine by an accredited institution of higher education in the United States.

Please send your resume, referencing Job Order Number **WEB405210** to the: PA CareerLink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Sr. Consultant. We are seeking qualified candidate(s) to analyze & review clients' requirements to plan data processing systems and network operating systems. Plan layouts and the installation of new network systems for small businesses. Design, develop, evaluate and implement techniques for software programs. Manage LAN & WAN stations covering upgrades and all computer technical work including TCP/IP, e-mail, database servers & Firewalls. Reqd: Bachelor's degree in Computer Science, Math or Engineering, MCSE and 2 years related experience. Please send resume to All Covered, Inc. 275 Grove Street, Suite 2-400, Newton, MA 02466 or fax to 617-556-0250 Attn: Director CS or e-mail to mhartman@allcovered.com. No calls, please. EOE

Software Engineer- Responsible for complex product design, systems analysis, and programming language. Performs design, development, implementation, and maintenance of large Object-Oriented/RDBMS-based client-server software systems and/or subsystems. Performs complex bug verification, release testing, and beta support for assigned projects. Researches problems discovered by quality assurance or product support and develop solutions. Requires a minimum of a Bachelor's Degree in Software Engineering, Computer Science or related field, with a minimum of three years experience in systems software development, design, and implementation, and demonstrated knowledge of C++, Smalltalk, and Visual Basic. Send resumes to BulldogIT, 210 12th Ave. South, Suite 209, Nashville, TN. 37203. Attention: Greg Watson

COMPUTER

PricewaterhouseCoopers LLP's Advisory practice has opportunities available for experienced professionals in the area of SAP Application Security Design. Positions require a bachelor's degree (master's preferred) in CS or BA and 1 to 5 yrs related exp. Additional qualifications needed include knowledge of SAP security and/or functional business processes & resources; ERP application implementation exp & design/implementation exp of SECURITY CONTROL for companies using SAP. Job site/location: Philadelphia, PA. Interested candidates please reference job code 4RGMTV & fax resume CE at 267-330-4146 or email cynthia.a.everitt@us.pwc.com. No phone calls please. Employer will only consider applicants authorized to work for any employer in the U.S.

Computers - Manager MIS. Oversee development of systems and networked client/server, multi-tiered management software for manufacturing/import co. w/ Windows NT, VB, SQL Server Design, ASP, EDI standards & add'l tools/languages. Reqs 6 yrs exp & Bachelor's Comp Sci, Engineering, or Math. Send resume to: Feizy Import & Export Co. 1949 Stemmons Freeway, Dallas, TX 75207 Attn: N. Garroussi

Programmer, level II position in Highland Heights, Ohio office. Send resume to Progressive Casualty Insurance Co., Attn: Donna Gray-Wise, IT Manager. Must reference job code #DGW031. EOE.

Intrado, Inc. seeks a Sr. Software Engineer to work in Lisle, IL & other unanticipated job sites in US; At sr level, dsgn & dvlp computer s/ware applics that utilize ORACLE applic servers on Win & UNIX platforms. Dvlp systm & s/ware reqmts, create architectures, code, test & debug applics. Utilize JAVA, J2EE, UML & Apache APIs & SDLC procedures in dvlpmt process. Reqmts incl: B.S. in comp sci or related field incl. comp. engg. & 5 yrs in all aspects of job offd. Respond via resume to HR@intrado.com & refer to 2952DS.

APPLICATION PROGRAMMER/ANALYST Analyze & program internet applications. Assist dvlpt team. BS Comp Sci or equiv, 2 yrs exp in job or as Web Designer, JAVA, ColdFusion, HTML, Graphic Design + exp w/ internet service admin req'd. Send resume to: Mr. Cadora, Atavia, Inc, 6075 Roswell Rd #450 Atlanta, GA 30328

DB Administrators needed to analyze, dsgn, dvlp, install & test IBM DB2 UDB packages on Win, Unix IBM-AIX, Sun-Solaris, RedHat-Linux, Win NT & 2000; tune Unix kernel parameters; write embedded SQL prgms & shell scripts; tools used incl Websphere, MQSeries, ERWIN, XML, Load runner, Aqua Data Studio, & DB2 Connect. Send resume to: Global Consultants, Attn: Hireme, 8800 Grand Oaks Circle, #140, Tampa, FL 33637.

Software Engineer (with Masters degree and 1 year experience or Bachelors with 6 years experience) -Williamsport, PA. Job entails and requires experience in testing, development and implementation of commercial applications using Oracle, JavaScript, ColdFusion Server and Studio, ESRI's ArcIMS, ArcGIS, ArcSDE, ArcView and Macromedia Dreamweaver. Relocation within USA possible. Attractive compensation package. Send resume to Supriya Palayekar, Palayekar Companies, Inc., 1959 East Third Street, Willlamsport, PA 17701.

Computer Support Specialist - A medical clinic is currently seeking a Computer Support Specialist. The job duties include designing plans for new systems and administering controllers that include DNS/DHCP/WINS Servers. Requires a minimum of 1 yr experience as Database Administrator/Network Security Administrator/or Systems Programmer & Developer and Bachelors degree or equivalent in Computer Engineering. Send Resume: HR Manager, An King Ang MD, P.C., 1 William Carls Drive, Commerce, MI 48082.

Systems Administrator - A healthcare company is currently seeking a Systems Administrator, Requires a minimum of 1 yr experience as I.T. instructor/Database Manager/or Database Administrator and Bachelors degree in business or computer with courses information technology. Send resume to HR Department, Continental Rehab Services, Inc. 28002 Universal Drive, Warren, MI 48092.

System Analyst wanted by UTHSCSA to analyze data processing problems for application to electronics data processing systems. Provide interface application and database solutions and related duties. BS in Computer Science and 2 years related experience required. Send Resume to Dr. Judith K. Patterson, PhD, STVHCS Ambulatory Care 11C6, 7400 Merton Minter Blvd, San Antonio, TX 78229.

Senior Consultant

(Glen Mills, PA and other locations throughout the United States). Responsible for supervising a team responsible for developing and implementing architecture for Enterprise Application Integration (EAI), data design and e-Commerce projects. Responsible for architecture, design, development, maintenance and enhancement using software packages like Rational Rose, UML, Rational ClearCase, PVCS, CORBA, MQSeries and other related technologies. Formulate, prepare and define system scope and objectives through research and fact finding to develop, modify and use existing system tools and languages including Sun Solaris. Lead a team of developers responsible for implementing the Extract-Transform-Load process using Unix Shell Scripts, Java, Oracle and related technologies. Develop project implementation and methodology as well as client summaries. Develop project implementation plan and technical solution work plans for EAI.

The wage offered is $85,176/year. The work schedule is Monday-Friday 9:00am-5:00pm. The minimum requirements are as follows: Bachelor's degree in Computer Science, Math, Engineering (any), Business Administration or Information Systems (employer regards a foreign degree as equivalent to a U.S. Bachelor's degree as determined by an accredited education evaluation service) + 3 years experience in the job offered or 3 years experience as a Senior Consultant, Consultant, Software Engineer, Programmer or Analyst. Related experience must include at least one year of EAI, Unix Shell Scripts, Java, Oracle, Rational Rose, CORBA, MQSeries, Sun Solaris, Rational ClearCase, PVCS and UML.

Please send your resume, referencing Job Order Number **WEB 404349** to the: PA Dept. L&I, 235 W. Chelten Ave., Philadelphia, PA 19144. EOE.

Embedded Software Engineer for GSM Wireless Systems Dvlpmt, incl dsgn, dvlpmt, integration & testing of low-level embedded s/ware for GSM subsystms. Specific duties: dsgn, dvlpmt & integration of RF chipsets for GSM, GPRS & EDGE handsets & dvlpmt calibration tool for RF characterization & calibration and integrating RF drivers w/a third party GSM protocol stack. Dsgn, dvlpmt & s/ware integration for wireless communications protocol stack such as GSM; work w/layer 3 & layer 2 protocol stack entities such as GSM Radio Resource Mgmt, Mobility Mgmt, Call Control & RLC/MAC; script dvlpmt for base station simulators (such as Rhodes & Schwarz CMU-200) & protocol analyzers (such as Tektronix K1297) for GSM systms; embedded s/ware dvlpmt on several h/ware platforms in C and C++ using Real Time Operating Systems; work w/emulators, debuggers, logic analyzers & configuration mgmt tools; & s/ware dsgn & implmtn using protocol stack machine concepts. Reqs Bach or equiv in Comp Sci or related field. 5yrs exp in job offd or 5 yrs exp in dvlpg wireless s/ware. Respond to HR Mgr, Job Code #SWENG02-IT, Elektrobit Inc., 11121 Willows Rd NE, Ste 200, Redmond, WA 98052.

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Manager, Technical Support

(Glen Mills, PA and other locations throughout the United States).Resolve operational and technical issues and monitor production cycles. Enhance production processing by developing innovative solutions and respond to requests and recommendations for the improvement of client services. Develop and maintain operational, technical architecture, data repositories, and application logic procedures and practices. Manage client projects and external resources at our global, national, regional and local offices. Conduct user requirement interviews in order to produce functional and technical requirement documents. Utilize knowledge of Microsoft SQL Server to facilitate the design of technical and application solutions identified during definition cycles. Oversee the development of technical and application solutions encountered during the design cycle utilizing various software development languages including Microsoft Visual Basic, ASP, COM, JavaScript, and XML. Deploy developed solutions using Microsoft SQL Server and Microsoft Visual Basic 6.0. Coordinate the data transfer process of deployment efforts, ensure the data's quality and integrity, lead user training and provide technical support for implemented applications.

The wage offered is $66,300/year. The work schedule is Monday-Friday 9:00am-5:00pm. The minimum requirements are as follows: Bachelor's degree in Computer Science, Engineering (any), Math, Information Systems, or Business Administration + 2.5 years experience in the job offered or 2.5 years experience as a Manager, Senior Consultant or Consultant. Related experience must include six months of Middleware Technology: Microsoft SQL Server and Development languages: Microsoft Visual Basic, Active Server Page (ASP), COM, JavaScript and XML.

Please send your resume, referencing Job Order Number **WEB 405010** to the: PA CareerLink, FLC Unit,235 W. Chelten Ave., Philadelphia, PA 19144. EOE.

Trustek, Inc. Consulting firm is seeking Software Engr. w/MS & min. 1 yr. exp. or equiv. & Prog. Analyst w/BS & 2 yrs. exp. or equiv. Travel/Relo required anywhere in US.

C, C++, NT, UNIX, Shell, Sybase, .Net Studio, VB.Net, ASP.Net, SQL Server, JavaScript, VBScript, CORBA, HTML/DHTML, ASP, CSS, COM/DCOM, COM+, Crystal Reports, Architecture, Erwin, Developer 2K, PL/SQL, SQL* Plus, Forms, Reports, Designer 2K, Modeling, Java, JSP, XML, XSL, J2EE, EJB, WebSphere, WebLogic, UML, Rational Rose, JDK, DataWarehousing, ETL, OLAP, Informatica, Cognos, Brio, Business Objects, SUN, Solaris, HP-UX, Veritas, EMC, SAN, OpenView, Oracle Clinical, ClinTrial, SAS, FDA regulations, Validations, Oracle Applications, nQuery, PeopleTools, PeopleCode, PeopleSoft, SAP R/3, SapScript, SmartScript, IDocs, ALE, EDI, BASIS, ABAP, BW, APO, SEM, SCM, ITS, Adaytum, Cognos Business Suite.

Applicant should also have exp. in interface w/hardware & software, provide functional implementation, config. train, analyze, implement, code, test, backup, install, manage, customize, tuning, AS-IS study, Internet/Intranet applications, stored procedures, triggers. Create database tools, tables, files, roles, indexes, space management and re-organize. Apply w/ resumes to Attn: Recruiter, 2 Ethel Road, Suite 202-C, Edison, NJ 08817.

Software Engineer wanted to analyze software rqts. & produce functional specification documents & implement software; create test specs for new subsystems; analyze & reengineer software legacy system; provide mgmt. w/effort estimations, implementation trade offs, security implications & software performance analysis; provide tech. leadership on N-Tier development involving web based front end, business logic components developed in Microsoft Visual Basic & Microsoft Visual C++, & back end database server; design & implement database & table structures, middle tier business logics w/ COM+ objects using VC++ & Visual Basic, & front-end for web based applications using ASP, XML, XSL, JavaScript & DHTML; client-side development, incl. client-side APIs to communicate w/ web servers w/o using web browsers; integration of Configuration Management Tools w/ a web server; integrate Microsoft Office Tools w/ a web-based application; use UML Modeling tools like Rose/Rhapsody to design complex software models; develop & maintain a reverse eng. tool for COM components, converting these components to UML design structures; develop & maintain CORBA & Real Time CORBA adapters for UML based code generator; assist customers & customer support team. Must have Bach. deg. or equiv. educ. in Comp. Sci. or related field & 2 yrs. exper. designing & developing web & client service apps. using ASP, Visual Basic, XML, DHTML, & bldg. object oriented solutions using VC++, & incl. exper. in integrating applications w/ SCC tools, & w/ MS SQL Server & proficiency w/ COM & Type Libraries & revise engin. of COM components, as well as w/ WindRiver's Real Time IDE (both for VxWorks & VxSim). Salary $74,000/yr. Send 2 resumes to Case # 200203976, Div. of Career Services, Labor Cert. Unit, 19 Staniford St., 1st Fl., Boston, MA 02114.

Network Administrator: Install, upgrade & support company LAN, WAN & electronic medical data communications system. Maintain network hardware & network OS. Req. Bachelor's in CS, CIS or related field, no exp. req. but must demo ability to perform duties through course or project in Database Management. Resume w/ transcript to HR Director, Wellcare Medical, P.C., 41 Mott St, 3Fl., New York, NY 10013.

Sr. Systems Administrator wanted by Garment Import/Distribution Firm in Manhattan. Must have Masters in Comp Engg or Comp Sci & 4 yr s/ware exp. Fax resume to: 212-290-8176.

IT PROFESSIONALS:

Senior Consultant

POSITION: (Glen Mills, PA and other locations throughout the United States) Utilize Object modeling techniques and methodologies with such tools as Rational Rose to design and develop N-tier architecture systems. Responsible for architecting EAI (Enterprise Application Integration) solutions and middleware environments and development using various middleware solutions such as IBM MQ-series, JMS (Java Message Service), EJB's (Enterprise Java Beans) and BEA Web Logic Application Server. Responsible for the design and development of Siebel 7.0 EAI adapters and integrating it with middleware tools such as IBM MQ-series. Develop modules in Object oriented programming languages Java - J2EE using JMS, RMI (Remote Method Invocation), EJB, JDBC (Java Database Connectivity) and C++ and integrated the modules with various RDBMS (Oracle, Informix). Responsible for overlooking various stages of Software development lifecycle including system analysis, design, development and implementation. Responsible for developing processes for implementing SEI-CMM (Capability Maturity Model) Level 5 Key Process Areas and implementation of key quality assurance processes at the project level.

The wage offered is $78,110/year. The work schedule is Monday-Friday 9:00am-5:00pm. The minimum requirements are as follows: Bachelor's degree or equivalent* in Business Administration, Engineering (any), Communication, Electronics, Information Systems + 4 years experience in the job offered or 4 years experience as a Senior Consultant, Consultant, Web Developer, Systems Engineer, or Assistant Systems Engineer. Related experience must also include 2 years of Object modeling (Rational Rose and Rational Unified Process), EAI Solutions and middleware solutions (TIBCO, IBM MQ-Series, JMS, EJB's and Web Logic Application-server), Seibel, Java, C++, SEI-CMM Level 5 (Capability Maturity Model), and Oracle, Informix. *Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determine by an accredited institution of higher education in the United States.

Please send your resume, referencing Job Order Number WEB406247 to the: PA CareerLink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Programmer Analyst w/exp in Front page/Visual studio, Access, MySQL, MS SQL, XSL, Macromedia Suite, MS projects, & Visio. Perform web/business Applic. Using Visual Interdev/ Macromedia Dreamweaver, cross browser, cross platform issues using DHTML, Dom Architecture, CSS, JavaScript & HTML. Mail resumes to: US Telemanagement LLC, 21 Sperry Avenue, Stratford, CT 06615.

Web Integration Specialist

To use web-related technologies such as ASP, JSP, XML and .NET framework components to develop and update current version software for clients, to develop Data-Driven web site and convert from windows based to web based applications and to develop web based and Win 32 based crystal reports. Req. a minimum of Bachelor in C IS or a related field, and proficiency in ASP, JSP, XML and .NET framework components. 40hrs/wk. Send resume to HR at U. S. Cost, Inc. 1200 Abernathy Road, #950, Atlanta, GA 30328. Fax: 770-481-1640.

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Design, architect and implement a leading edge portal application including BroadVision One-To-One Enterprise, Vignette Application Portal (formerly Epicentric), BEA Weblogic Server, or Websphere to build the enterprise portal, with specialized expertise around State run portals functionalities and constraints. Implement architecture design involving intra/inter-enterprise integration, backend integration, batch processes, data conversion and adaptors implementations using tools included in portal applications. Design, architect and implement content management systems to build centralized content archive, publishing, editing systems. Responsible for the implementation and maintenance of system templates for data entry, workflows for content approval and submission, presentation modules for data presentation and previews Content Management Systems. Utilize Content Management Systems (Interwoven, Vignette or Stellant) with build-in adaptors to submit data to various relational database management systems (RDBMS), Oracle 8i, and knowledge management systems. The wage offered is $97,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Engineering (Any), Telecommunications, Math, Information Systems or Business Administration + 5 years of experience in the job offered or 5 years of experience as a Manager or Systems Administrator. Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credentials evaluation service. Related experience must include at least 2 years of experience with portal applications (any of the following web applications: BroadVision, Epicentric, BEA or Websphere) and Content Management Systems (any of the following: Interwoven, Vignette or Stellant).

Please send your resume, referencing Job Order Number WEB406202 to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Programmer: Design, implement, and test embedded systems. Redesign and implement the new systems in OO style on QNX or embedded Linux. Implement system device drivers in Assembly language. Provide Database support with SQL Server 2000 and Access. Req. MS or equivalent in CS with proficiency in C++, Embedded Linux, SQL Server 2000, SDL, and CMM. 40 hr/wk, 9-5. Send resume to Cadillac Jack, Inc. at 2420 Meadowbrook Parkway, Duluth, GA 30096

Advantica, Inc. seeks Software Developer in our Carlisle loc. Design, dev + maintain software applics, user interfaces + relational databases within project guidelines. Work in team env. with technologies incl internal Solver component tech, MS Vis Bas, C++, Java + other OO software devt languages. Advise group mgmt. re new software devt, eng'g, geospatial, + numerical solutions technologies + industry trends. Must have BS in Comp Sci, Geospatial Info, or related field + 1 yr relevant exp. Resume to Heather Eickhoff, Advantica, PO Box 86, Carlisle, PA 17013.

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.)

Responsible for Treasury - Corporate Finance SAP consulting engagements utilizing different modules of the SAP R/3 system comparing them to other similar systems within the Financial Services Industry. Provide information technology solutions for administrative functions such as Cash Management, Treasury Management and Loans Management. Familiar with Financial Accounting functionality and configuration including General Ledger, Bank Accounting, Accounts Payable and Accounts Receivable. Set General Ledger accounts, Customers and Vendors, House Banks and Bank Accounts, financial accounting Document Types, Electronic Bank Statement functionality, Automatic Payment Program, and Lockbox functionality in the system. Involved in Treasury and Corporate Finance Management functionality and configuration including Cash Management, Money Market, Foreign Exchange, Derivatives, Securities, Loans Management, Market Risk Management, Inhouse Cash and Limit Management. Set Cash Position, Liquidity Forecast, investment Product Types, Transaction Management, Valuation rules for accounting and mark-to-market purposes, Investment, Debt and Derivative Accounting rules and financial Market Data in the system. Implement system methodology by determining scope, identifying gaps in functionality and common issues, mapping and documenting business processes, designing system configuration, documenting and executing unit and integration tests, preparing training materials and planning training sessions and planning post-implementation support. Participate in corporate cash management process and capital markets and financial securities processing. Knowledge of accounting principles which apply to Debt and Financial Assets, as well as market risk management function including the determination of sources of risk at a transactional level and the hedging strategy.

The wage offered is $109,677 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree in Computer Science, Engineering (any), Math, Information Systems, Business Administration or Finance + 5 years of experience in the job offered or 5 years of experience as a Manager, Senior Consultant or Account Executive. Related experience must include at least three years of consulting within the Financial Services Industry utilizing SAP R/3, Treasury and Corporate Finance Management, Corporate Cash Management Processing, Capital Markets and Financial Securities Processing, Accounting Principles relating to Debt and Financial Assets and Market Risk Management Function.

Please send your resume, referencing Job Order Number WEB406468 to the: PA CareerLink, FLC Unit, 235 West Chelten Avenue, Philadelphia, PA 19144. EOE.

ASP.NET Developer: Web app. Development including database, business object and presentation layer design and programming. Maintain web apps. used in Judicial Agencies. Position requires developing dynamic government/commercial web sites using C#, ASP.Net, XML, SQL, and migrating existing ASP sites into ASP.Net. Req. BS or equivalent in CS with 9 months exp in job offered or as Web Developer. Must be proficient in ASP.NET, C# XML, SQL, and JavaScript 40 hr/wk, 9-5. Send resume to Advanced Computer Technologies at 600 S.Court St Montgomery AL 36104

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Provide recommendations to client and staff for technical designs, analyses and technical architecture of web based applications. Design a Framework for development. Establish a methodology for Software development. Manage the infrastructure build activities (e.g. LAN, WAN. Server, Database, Desktop). Develop comprehensive testing plans. Define the plan deliverables (implementation plan, work plan, resource plan, budget, business case). Apply design and modeling patterns in Java , JSP, Servlets , Java beans and J2EE technologies. Develop Portals using J2EE and Java technologies. Integrate various applications using Java Middleware and various remoting technologies including EJB (Enterprise Java Beans), RMI (Remote Method Invocation), SOAP (Simple Object Access Protocol), UUDI (Universal Description, Discovery and Integration), Web services. JMS (Java Messaging Services), JDBC, Java Data Objects. Design and develop load-balanced , scalable Architecture for Enterprise Applications built on clusters of Application Servers including IBM WebSphere, BEA Weblogic and web servers (Tomcat , Apache, iPlanet and IIS). Design and develop SQL queries. Store procedures and database creation in Oracle and MS-SQL Servers. Select appropriate tools/software/hardware and customize them to meet specific project and client requirements. Manage relationship with Vendor partner consultant. Define the plan deliverables (implementation plan, work plan, resource plan, budget, business case).

The wage offered is $73,424 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 5 years of experience in the job offered or 5 years of experience as a Senior Consultant, Consultant, Manager, Programmer or Systems Analyst. Related experience must include technical implementation and development of web based applications utilizing J2EE and Java technologies such as JSP, Java Servlets, EJB, RMI, JDBC, and Java Beans. Employer will deem foreign educational credentials evaluated by an evaluation service to be the equivalent of a U.S. degree.

Please send your resume, referencing Job Order Number WEB406664 to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Project Manager - Financial Software

Duties include foreign currency conversion, working knowledge of Crystal Reports, SQL/Clarus PeopleSoft, and Project Management. Applicants must have Bachelor's or equivalent (education, experiential, or combination of education and experience equivalent is acceptable) in MIS or related field and experience in the job offered, finance, financial auditing, or accounting.

For Confidential consideration, please submit resume along with salary history to Cindy Rose, PHR @ ADESA Corporation, 13085 Hamilton Crossing, Carmel, IN 46032.

No agencies or phone calls please.

EOE/M/F/D/V - Smoke & Drug Free Environment, Drug Test Required.

IT PROFESSIONALS:

Consultant

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Responsible for the analysis, design, development, and implementation of Product Information and Lifecycle Management (PILM) solutions based in a Windchill platform for business clients. Design, develop, and enhance various components of Windchill-based Product Information and Lifecycle Management system. Responsible for architecting solutions to improve the process of client solution deployment and component management, as well as gathering and analyzing client requirements and designing Windchill Solutions. Involved in the selection, installation, and configuration of hardware and software components, as well as the identification of data requirements, process requirements, and integration requirements. Responsible for engaging in Windchill customization utilizing Oracle, Java, and UML (Unified Modeling Language), as well as product configuration management, change management, document management, sourcing factor, and Info Engine. Involved in the installation, configuration, testing, data migration, deployment, and support of solutions. Responsible for Windchill functionality, implementation methodology, and customization standards.

The wage offered is $78,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, Information Systems, Engineering (any) or Business Administration + 2 years of experience in the job offered or 2 years of experience as a Consultant or Implementation Consultant. Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credentials evaluation service. Related experience must include Product Information and Lifecycle Management (PILM), Windchill Solutions, Oracle, Java, and UML (Unified Modeling Language).

Please send your resume, referencing Job Order Number WEB406372 to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE

Sr. Prog/Analysts to manage teams to analyze, design, maintain appls using Java, HTML, VB, ASP, MS Access etc under UNIX/Windows os; create/modify business documents using Smart Forms and SAP Script; analyze business processes to determine reqts; implement appls, perform strategic planning and operations support; provide end user training. Require a B.S. or foreign equivalent in CS/Engg (any branch) with 3 yrs exp in IT. High salary. F/T. Travel involved. Resume to HR, Smartsoft International, Inc., 4898, South Old Peachtree Rd, Norcross, GA 30071.

Senior Great Plains Consultant - analyze, design, test & implement Microsoft Great Plains Software for clients; analyze client business requirements & determine how the software can best meet those requirements; conduct training sessions for clients; provide pre- & post-sales customer support; duties require exp. w/ Microsoft Great Plains Software, SQL Server, Visual Basic, FRx, Crystal Reports & Windows 98/00/NT. Requires BS in computer science, business administration or accounting plus 5 YR related exp. Mail resumes to Aston Business Solutions, ATT: Melissa Wilhelm, 7050 Jomar Drive., Whitmore Lake, MI 48189.

IT PROFESSIONALS:

Senior Consultant

POSITION: (Glen Mills, PA and other locations throughout the United States). Design and architect the business object framework using Object Oriented Methodology. Design and develop the business object architecture conforming to best practices for J2EE (Java 2 Enterprise Edition) technology. Responsible for the design and development of Java Server Pages (JSP's), Java Servlets and Enterprise Java Beans (EJB's) to depict the business objects to deploy them onto BEA's Weblogic Server. Setup, configure and administer the BEA Weblogic Server and configure the servers to perform as a cluster. Responsible for testing Load Balancing and failover capabilities of the BEA Weblogic Server. Implement Interwoven Team Site Content Management System to develop and redesign enterprise content management solutions. Responsible for developing creation of content management workflows and roles applicable to corporate organization structure. Design and develop data loading and processing framework supporting multiple databases such as Oracle Informix and Microsoft Access. Responsible for identification of multi-format external data feeds, data modeling and loading into Oracle using SQL Loader (ETL tool).

The wage offered is $98,226/ year. The work schedule is Monday-Friday 9:00am-5:00pm. The minimum requirements are as follows: Bachelor's degree or equivalent* in Comp Science, Engineering (any), Business Administration, Information Technology or Mathematics + 4 years experience in the job offered or 4 years experience as Senior Consultant, Consultant, Systems Architect or Analyst. Related experience must also include at least 2 years of Object Oriented Design, J2EE, BEA Weblogic Server Administration, Oracle, and ETL tools (Extract, Transform, Load). *Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credentials evaluation service.

Please send your resume, referencing Job Order Number **WEB405098** to the: PA CareerLink, FLC Unit 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE

ObjectWin is looking for Programmer/System Analyst or other IT professionals. Applicants must have BS or equivalent. Skills in ASP.Net, B2B, VB, Java, HTML, VB.Net, XSL, CSS, MS CMS, SSL & MS certified preferred. Competitive wage. Apply at skarande@objectwin.com. EOE. No calls.

Techgene Solutions has openings for System Analysts or Software Engineers. Candidates must have BS with experience. Prefer skills in Cobol, JCL, Oracle, SQL, VB, C/C++. Travel may be required for some positions. Competitive salary. Please apply at info@techgene.com. No calls. EOE.

Multimedia Web Developer. Consults w/ design, technical, & marketing staff to plan web site dev. Develops graphic & technical architecture of web sites including database design & user interface design. Req Bach. in Advertising or Related Field & 1 yr. of exp. in job or 1 yr. of exp. as a Graphic Designer/ Visualizer. Send Resume: Steven Cohen, Tempart, Inc., 412 SE 13th St., Fort Lauderdale, FL 33316 (job-site).

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Oversee multiple technical engagements including major projects. Formulate and define systems scope and objectives for engagements. Drawing on full technical knowledge of all phases of applications systems analysis and programming as well as knowledge of the business or function for which the application is designed, the Manager will be responsible for directing systems analysts and programmers on engagements and ensuring quality control. The manager will facilitate design sessions and assist client technical architects with the technical design documents (TDD's). Will be responsible for designing and prototyping utilizing SAP APO and SAP R/3 software for Supply Chain Management. Will be responsible for directing systems analysts and programmers on engagements and ensuring quality control. Will actively participate in complex proposals, development and sales presentations. Will contribute to engagements to produce results within budget and timing constraints.

The wage offered is $122,500 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 6 years of experience in the job offered or 6 years of experience as a Senior Consultant, Process Engineer, System Analyst, Programmer, Production Planner, Production\Systems Controller. Employer will accept 5 years of progressively responsible work experience in a related field as sufficient to satisfy the degree requirement. Related experience must include at least three year of experience in SAP R/3 and at least one year of experience in SAP Advance Planner and Optimizing (APO).

Please send your resume, referencing Job Order Number WEB406425 to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Systems Analysts to work as consultants at client sites in the U.S. and abroad. Imprint, customize & upgrade Oracle ERP s/ware pkgs. Reqs: BA/BS in Comp Sci, Eng'g, Bus, Logistics, HR, or related field + 2 yrs exp w/Oracle Apps or DB's. Send resumes, refs, and salary req's to Attn: HR, IT Convergence, 150 E. Gilman St, Suite B2200, Madison, WI 53703 or resume@itconvergence.com.

Infogen is seeking IT professionals. Req. BS. Skills in following area are plus: Oracle9i, Weblogic / WebSphere, C++, Visual C++, VB, COM, STL, MTS, MSMQ, ASP, Java, HTML, XML, MTS, MSMQ, ADO, UML. Travel is required. Send resume to infojobs@infogeninc.com. EOE.

Workforce Software has openings for S/W Engineer, IT Professionals to develop Time & Attendance software using Java, SQL, Servlet, JavaScript, JSP, Oracle, HTML. Min req is BS or equivalent with skills of SQL, Servlet, JavaScript. Pls contact info@workforcesoftware.com. EOE. No calls.

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Analyze, design & implement integrated customer & product profitability solutions, focusing on the needs of leading telecom and financial services clients, combining methodologies & tools in the areas of Data Warehousing, Customer Relationship Management (CRM) & Activity Based Costing (ABC) using the OROS application. Analyze relevant expenses, components of the activity value chain & structure of the product & client hierarchy. Develop methodology to allocate costs from the resource to the identified activities. Manage the design & development of model structure, data loading & creation of validation reports using OROS & other ABC tools. Lead full lifecycle Data Warehousing development using relational & multidimensional databases & data transformation tools. Design & implement reporting architectures & solutions using On-Line Analytical Processing (OLAP) tools. Perform predictive statistical modeling to analyze customer segments, churn, campaign management & cross-selling strategies using Quadstone & SAS data analysis & data mining product suites. Develop client relationships, write internal methodologies & presentations, interact with alliance partners & research industry & technology developments.

The wage offered is $118,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, Engineering (any), Information Systems or Business Administration + 4 years of experience in the job offered or 4 years of experience as a Senior Consultant, Consultant, or Systems Analyst. Related experience must include 1 year in Activity Based Costing, OROS ABC, Quadstone's Data Mining, On-Line Analytical Processing (OLAP), and Customer Relationship Management (CRM). Must have experience in the financial services industry. Position may require extensive travel up to 100%.

Please send your resume, referencing Job Order Number **WEB405157** to the: PA Careerlink, FLC Unit, 235 W. Chelten Avenue, Philadelphia, PA 19144. EOE.

Programmers & Software Engineers: Analyze, design, develop apps., in: (A) Vertex, Goldmine, Lawson Financials, Oracle/SQL Server 2000; (B): Oracle and related tech., SAS & related SAS tools, Proc Format, Metadata, Cognos, Dataminer. Oracle/ SAS Cert. preferred. Attn: Chet Patel, 120 Bluegrass Parkway, Alpharetta, GA 30005.

Computer Security Coord. in Kissimmee, FL. Develop computer programs for med ofc applics. Implem security measures to safeguard info against unauth'zed modif. or disclosure. Ensure security, efficiency & uniformity of systems for all area locations. Provide training & user support svcs. Est. emergency data processing & data retrieval plan. 8:30am-5:30pm, M-F. B.S. in Comp. Engg, or equiv., 2 yrs exp. in position or as Prgrmr/Analyst req'd. Send/ Fax resume to: BVL Family Practice & Specialty Ctr, Fax #: 407-348-5573. ATTN: Diana.

IT PROFESSIONALS:

Manager

Position: (Glen Mills, Pennsylvania and other locations through the U.S.). Responsible for managing consulting projects involving the provision of SAP Business Intelligence solutions as well as IES (Integrated Enterprise Solutions) within the Technology practice. Formulate and define scope and objective of engagements and provide managerial guidance and support to lower level project staff members (10-15) involved in data warehousing, SAP R/3 implementation (including data structures and information systems) in the areas of FI/CO (Logistics and/or Finance Controlling). Utilize functional expertise of SAP implementations with a particular focus on the implementation of SAP BW (SAP Business Warehouse) including FI/CO, MM (Materials Management), PP (Production Planning) and SD (Sales and Distribution) modules as well as experience with SEM (Strategic Enterprise Management). Apply knowledge of SAP delivered content and custom development (custom extraction and cube design) as well as third party data extraction tools and ITS and BW web reporting to effectively carry out engagements for national and multinational clients.

The wage offered is $150,000 per year. The work schedule is Monday-Friday, 9:00 am to 5:00 pm. The minimum requirements are as follows: Bachelor's degree or equivalent in Computer Science, Math, International Finance, Information Technology or Business Administration + 5 years of experience in the job offered or 5 years of experience as a Manager (any), Senior Consultant, Consultant or Coordinator (IT). Employer will regard a foreign degree to be equivalent to a U.S. Bachelor's degree as determined by an accredited credentials evaluation service. Related experience must include at least 2 years of functional experience in SAP implementations providing SAP Business Intelligence solutions with a specific focus on SAP BW implementations, including FI/CO, MM, PP or SD modules, as well as SAP R/3 systems. Please send your resume, referencing Job Order Number **WEB405192** to the: PA Careerlink, FLC Unit 235 W. Chelten Avenue Philadelphia, PA 19144. EOE.

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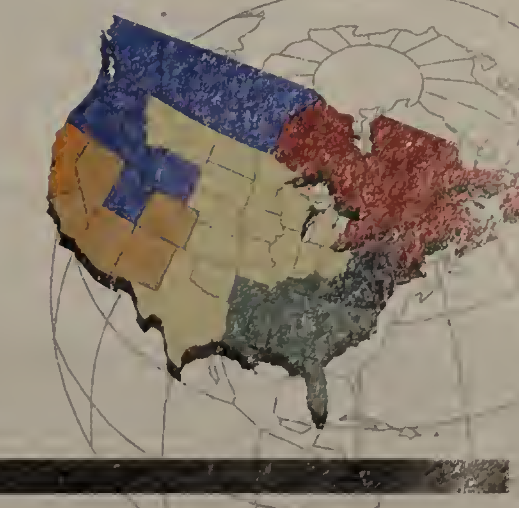

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Linux

continued from page 1

strategic deployments, according to George Weiss, lead analyst for Gartner's Unix, Linux and open source trends.

"Identity management, directory services, server virtualization, server maintenance, patch management are all part of an entire ecosystem that has to be [deployed] for Linux and has to be added to the enterprise environment," Weiss says.

Those considerations force IT executives to consider the expense of adopting Linux beyond its established place in single-purpose deployments such as Web, DNS and Dynamic Host Configuration Protocol servers.

"The question becomes, how do I manage this, how do I secure it using the common set of policies I already have," says Fred Wettling, infrastructure architect for Bechtel, a global engineering, construction and project management firm. The firm uses a standard security and management infrastructure to which any new software must adhere. "Some level of conformity can drive down costs."

He says adding a new level of complexity by introducing nonconforming software has to be taken into account when evaluating product choices. "We may save on the software but the cost of the transition is something we have to take a look at," he says.

Even more basic considerations can hit home.

"I now have to clear any decisions through our infrastructure group because of [Health Insurance Portability and Accountability Act] regulations. I have to detail who is responsible for patching and other functions," says Jeff Allred, manager of network services for the Duke University Cancer Center in Durham, N.C.

Allred says patch problems marred an experiment with Red Hat Linux at Duke. In addition, he says another consideration is the cost of obtaining Linux expertise and staff training.

"You have to use the 10-times rule," says Gary Hein, an analyst with Burton Group, who will present an online seminar on Burton's Web site this week on Linux's benefits and challenges. "To make a change it has to be 10 times faster, cheaper or better." He says that was true for Linux and Web servers, but is not currently the case on the desktop or for network services.

Even Linux proponents say expertise with the operating system and deploying it for valid reasons can make all the difference.

"If you don't have the expertise with Linux, I can see your concerns," says Steve Henry, president of Executive Business Systems, an outsourcing firm in Naperville, Ill. Henry has written script and utilities to manage Linux servers that run anti-spam and anti-virus services. "With these specialized servers I just set them up and they run. The ongoing cost of Linux, therefore, is lower than with Windows machines."

As far as infrastructure and application limitations, vendors are starting to fill the gaps.

Red Hat, which Gartner says holds nearly 80% of the U.S. Linux market, is developing its Open Source Architecture, a blueprint for open source middleware, applications and management tools designed to push Linux into network infrastructure.

Novell detailed its Linux strategy last month. It plans to improve its Linux-capable Open Enterprise Server with proven directory and management tools. IBM is pushing Linux-based middleware, and Sun offers its directory on Linux. Oracle, PeopleSoft and SAP are among the major vendors using their applications to sweeten the pot.

It all adds up to pressure on Microsoft. The company's Windows Server System is an attempt to create an integrated middleware platform complemented by the desktop operating system. It also is trying to trump open source with its Shared Source Program for sharing source code but under strict controls, and with the release last week of its first open source software, a Windows installer tool set, under the Common Public License.

"We think people are looking at TCO in a more balanced way now," says Martin Taylor, general manager of platform strategy at Microsoft and leader of the company's "Get the Facts" campaign on Unix and Linux. "For the most part, customers would concede the TCO discussion to Linux."

Users and analyst agree there are merits to the hype.

A recent independent study by The Yankee Group and Sunbelt Software (which is a Microsoft partner) shows Linux won't necessarily provide cost savings and indeed could cost more depending on the details of the rollout (see graphic, left).

"When it comes to Linux, you don't get what you don't pay for," says Laura DiDio of The Yankee Group, author of the forthcoming Web-based survey of 1,000 IT administrators and corporate executives. Among other conclusions the survey reached was that a majority of corporations with 5,000-plus end users say Linux requires from 25% to 40% more full-time support specialists than Windows or Unix, and that skilled Linux administrators in large urban areas command a 20% to 30% greater premium than their Windows and Unix counterparts.

But DiDio says the big issue for businesses revolves around Linux vendors' restricted indemnity clause for products, which protect against damage, outages and legal disputes such as The SCO Group's claim against IBM. ■

By the numbers

The number of servers shipped with the Linux operating system is expected to grow over the next five years, while Windows implementations will slow, according to Gartner.

Operating system	2003	2004	2005	2006	2007	2008	2009
Windows	3,849,348	4,308,432	4,619,203	4,863,704	5,106,132	5,279,349	5,388,071
Linux	697,397	937,286	1,185,346	1,386,212	1,552,862	1,738,531	1,925,122
Unix	519,502	534,263	527,619	508,341	493,569	487,254	479,064
Other	485,117	435,975	368,783	334,157	324,693	314,611	304,561

Linux vs. Microsoft

The Yankee Group and Sunbelt Software recently did a cost of ownership study with 1,000 IT administrators and corporate executives comparing Linux and Windows that included these key findings:

- Linux provides businesses with excellent performance, reliability, ease of use and security that is equivalent to Unix and Windows Server 2003.
- Ninety percent of the 300 large corporations with 10,000-plus end users that responded to the survey indicated that a significant or total switch from Windows to Linux would be prohibitively expensive, extremely complex and time-consuming, and not provide any tangible business gains for the organization.
- Only 4% of Unix customers and 11% of Windows businesses plan to replace all of their servers with Linux. And less than 5% of organizations will replace their Windows desktops with Linux.

Adtran

continued from page 16

Abner Germanow, an analyst with IDC. Adtran has a good reputation for re-engineering hardware for well-established technologies and selling them for less than companies that pioneer the technology itself, Germanow says.

He says the first offering of the 1224 features a barebones Layer 2 Ethernet switch. But Adtran says it is planning another 24-port NetVanta box with Gigabit Ethernet desktop support. Two of the current 1224 models support Gigabit uplinks. Other future improvements include a dual T-1 card and features such as quality of service to support VoIP and Power over Ethernet, the company says.

Future additions to the NetVanta family also will include Layer 3 switches and integrated DS-3 access routers, Adtran says.

The four new 24-port NetVanta products are the 1224 ($795), an Ethernet switch; 1224R (about $1,200), an Ethernet switch with WAN router; 1224ST ($895), a switch with two Gigabit uplinks; and 1224STR (about $1,300), a switch and WAN router with Gigabit uplinks. Models with routers include a firewall and have optional VPN support for $695. ■

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The End-to-End Networking and Communications Event

BackSpin Mark Gibbs

Anomalous things

Anomalous Message: "An unexpected error has occurred."

— An unexpected message unexpectedly produced by Microsoft Word.

The error message I quote above fascinates me in a strange and unwholesome way because it raises all sorts of questions: If the error is unexpected are there errors that are expected? And if there is such a thing as an expected error, couldn't someone prevent it from happening?

Moreover, when an unexpected error happens how do you know it is actually an error rather than being perhaps an unexpected feature ... because if it is unexpected, how can you know if it is an error or not?

This reminds me of my previous favorite error message: "Error: No error," which Windows used to occasionally show and is available for your pleasure on various other platforms (go to www.nwfusion.com, DocFinder: 1566, for an explanation of the Windows version). But I digress ...

What really gets me is that despite searching the 'Net, I can find no reference to this exact message from Word because the text "An unexpected error has occurred" wasn't accompanied by any other explanations for my error (or should that be "non-error"). There was no status code, no supporting explanation — simply that lean and hungry-looking, Zen-like, philosophically challenging, totally unhelpful text that preceded Word disappearing along with my document rather like your drinking buddies disappearing when that huge bar bill appears.

Anomalous Relationship: "We are both big developers of intellectual property. We both own lots of patents."

— Microsoft CEO Steve Ballmer referring to a commonality between his company and Sun that really doesn't explain their new accord unless you understand the subtext.

The day after April Fool's Day we saw a fine exhibition of the old Italian saying, "Keep your friends close and your enemies closer," as Ballmer and Scott McNealy, CEO of Sun, hugged each other, swapped Red Wings jerseys and declared, "We do both believe in intellectual property."

Let me rephrase that statement: "We do both believe that open source in general and Linux in particular are real threats to our businesses."

So to settle Sun's outstanding law suit against Microsoft over the latter's fast and loose ways with Java, Microsoft shook $1.2 billion out of its coffee fund and Sun suddenly had a new best friend.

In the light of McNealy having dressed up as a penguin way back in 2002, the newfound friendship reeks of desperation and opportunism on Sun's part and business as usual at Microsoft. Might Microsoft buy Sun? Hmm.

Anomalous Legalities: "IBM's untimely responses to discovery have hindered orderly prosecution of the case."

— The SCO Group's lawyers trying to make the company's case against Big Blue sound like normal business — which might well be how it actually is for them.

SCO, in its ongoing efforts to tick off as many people as possible for as long as possible, is trying to drag out its case against IBM by asking the judge to slide the trial from the currently scheduled April 2005 to September 2005. SCO says IBM isn't cooperating with the discovery process, while IBM says SCO is being unreasonable in asking for every version of Unix it ever had anything to do with.

The fact that after all this time SCO refuses to substantiate its claims of copyright infringement in Linux (the company first sued IBM more than a year ago) continues to make SCO look like Mafia hoods trying to shake down neighborhood business owners.

What do you find anomalous? Reports to backspin@gibbs.com.

Layer 8

By Melissa Shaw

We know where you live

Libertarian magazine *Reason* will be spooking the hell out of its 40,000 subscribers with its June issue.

Each reader will receive a customized cover featuring a satellite picture of his neighborhood with his home circled in red.

Editor in Chief Nick Gillespie says the 40,000 individualized covers hammer home the point of the cover story — the power and pervasiveness of databases and their impact on personal privacy, or lack thereof.

Anyone else think *Reason* won't have a problem getting folks to re-subscribe?

www.nwfusion.com, DocFinder: 1549

Paging Dr. Blinky

A new study at Beth Israel Medical Center in New York shows that surgeons who play video games make fewer mistakes in surgery. Shouldn't that be "surgeons who play video games well make fewer mistakes in surgery"?

Anyway, the brains behind this research say the hand-eye coordination promoted by joystick-controlled video games improves surgeons' dexterity in laparoscopic procedures.

So by all means before your next procedure make sure your surgeon reached at least the banana level in Ms. Pac Man.

DocFinder: 1550

Lordy, lordy look who's 40!

IBM's S/360 mainframe, which put the "big" in Big Blue, hit the big 4-0 last week. The occasion had many happily walking down memory lane remembering the good ol' days, like how IBM spent $5 billion developing the system, which today would translate into $30 billion.

While mainframes might be as cutting-edge as a butter knife these days, they put more than $4 billion in IBM's pockets last year. We should all do so well at 40.

DocFinder: 1551

The dark side of mobile

It used to be we only had to worry about cell phones giving us brain tumors, but their ubiquity and popularity are now causing more worries and complications.

First there's the fact that mobile phones have become the detonating device of choice for terrorists who want to blow up something and be miles away from the scene of the crime. That's left governments asking "Should we or shouldn't we?" when it comes to using cell-blocking technology around likely terrorist targets.

On an unrelated note, cell signals also are interfering with police radios and other emergency services. Radios used by emergency services run on the same 800-MHz spectrum as cell calls from some wireless providers. Fixing the problem means sorting out the spectrum, which has brought differences of opinion from profit-conscious providers.

DocFinder: 1552

Worst technology ever

The Marts (Wal and K) are planning to sell a new $79 DVD player that would make the Puritans proud.

Manufactured under the RCA brand, the player contains technology that would skip all the good stuff — violence, sex and swearing — in our favorite DVDs. Man, we're thinking the box would self-destruct if you tried to sneak a Tarantino disc in there.

DocFinder: 1557

Shaw is chief cook and bottle washer of Layer 8, your online rumpus room featuring the best of Network World Fusion and the not-just-networking news. She can be reached at layer8@nww.com.

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